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THE ORDER SCHIZOMIDA (ARACHNIDA) IN THE NEW WORLD. III. *MEXICANUS* AND *PECKI* GROUPS (SCHIZOMIDAE: *SCHIZOMUS*)[1]

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ABSTRACT

A systematic revision of the *Schizomus mexicanus* and *S. pecki* species groups (Arachnida, Schizomida, Schizomidae) is presented. The following species are described and assigned to the *mexicanus* group: *S. mulaiki* Gertsch, *S. bartolo* Rowland, *S. lukensi* Rowland, *S. davisi* Gertsch, *S. reddelli* Rowland, *S. mexicanus* Rowland, *S. pallidus* Rowland, *S. portoricensis* (Chamberlin), *S. moisii* Rowland, *S. cookei* Rowland, and *S. mitchelli* Rowland. Three taxa known only from females (*Schizomus* spp., OTU Nos. 1, 2, and 11) are also briefly described and assigned to the *mexicanus* group. The following species are described and assigned to the *pecki* group: *S. firstmani* Rowland, *S.* sp. cf. *sbordonii* Brignoli, *S. pecki* Rowland, and *S. guatemalensis* Chamberlin. Brief descriptions are also provided for four taxa assigned to the *pecki* group that are known only from females (*Schizomus* spp., OTU Nos. 2, 6, 7 and 8).

INTRODUCTION

This is the third part of a revision of the arachnids of the order Schizomida in the New World. The first part (Rowland and Reddell 1979a) included the family Protoschizomidae and the *Schizomus dumitrescoae* group of the family Schizomidae. The second part included the primarily South American *Schizomus simonis* and *S. brasiliensis* groups (Rowland and Reddell 1979b). The present report includes a revision of the largely Mexican *Schizomus mexicanus* and *S. pecki* groups. Table 1 may be used to compare the species groups included here with the remaining groups of New World schizomids. Uniform descriptions are included for all species, and include all characters which have been found to be of value in distinguishing taxa (see Rowland and Reddell 1979a for a discussion of the characters used). A fourth report will cover the remaining New World schizomids. A detailed discussion of the zoogeography and phylogeny will follow the systematic revision of the order.

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As in the previous report (Rowland and Reddell 1979b) several species are briefly described for which males are not known. These taxa are not named, but are included because they are of value in analyzing the phylogenetic and zoogeographic relationships within the order (see Rowland and Reddell 1979a, 1979b).

The present study is based to a large extent on a dissertation prepared by the senior author at Texas Tech University, Lubbock, Texas (Rowland, 1975a).

Family Schizomidae

MEXICANUS GROUP

Description.—Members of this group are moderate to large in size (0.98-1.44 mm carapacial length). The color is usually brownish but green species occur. Eyespots are present in epigean species, but are usually indistinct and ovoid with diffuse margins; they are frequently absent in cavernicoles. The carapace has two or three pairs of dorsal and two apical setae. Males: abdomen never elongate; abdominal process absent; flagellum usually small, ovate, and dorsally compressed; dorsal surface usually bears a pair of lateral depressions. Females: flagellum short and composed of three articles; spermathecae generally characterized by an enlargement of the median pair and reduction of the laterals; some species lack the laterals altogether, but in some they are nearly as large as the medians; a few species have terminal enlargements. The pedipalps sometimes are highly sexually dimorphic, but sometimes variably so. In species with dimorphic pedipalps an elaboration of all segments and production of a tibial spur apposible to the tarsus-basitarsus is characteristic; however, individuals with only slightly dimorphic pedipalps do not express the spur.

Distribution.—Excluding *Schizomus portoricensis*: United States: Texas. México: Nuevo León, Tamaulipas, San Luis Potosí, Guerrero Veracruz, Oaxaca, Chiapas. *S. portoricensis*: Bermuda, Florida, Antilles, southern México, Central America, northern South America, Galapagos Islands.

Remarks.—*Schizomus antilus* Hilton 1933, from Cuba has not been studied by us. The types, reportedly deposited in the Pomona College, California, Museum, have not been located. Based on measurements given in the original description, *S. antilus* is probably a junior synonym of *S. portoricensis*. See Table 2 for comparisons of the species in the *mexicanus* group.

Subordinate taxa.—Unnamed complex: OTU No. 1, Otu No. 2; *Mexicanus* complex: *S. mulaiki, S. bartolo, S. lukensi, S. davisi, S. reddelli, S. mexicanus; portoricensis* complex: *S. pallidus, S. portoricensis; moisii* complex: OTU No. 11, *S. moisii; mitchelli* complex: *S. cookei, S. mitchelli.*

Schizomus sp., OTU No. 1

Figs. 1, 45

Schizomus sp.: Reddell 1971a:219 [Grutas de Cacahuamilpa record only].
Schizomus sp. 1: Rowland and Reddell 1977:80, 84, 96.

Description.—Female. Color brownish. Carapace with two pairs of dorsal and two apical setae. Eyespots absent. Anterior sternum with 11 bifid setae. Abdominal terga I-VIII with two setae, tergum IX with four setae. Vestigial stigmata darker than sterna.

Flagellum composed of three articles. Pedipalpal trochanter produced distally; tarsal-basitarsal spurs about 1/4, claw about 1/2 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 43-5-8-10-11-10-20. Other leg segment measurements given in Table 3. Median and lateral spermathecae slightly divergent, the medians somewhat larger, medians and laterals with variable, slightly sclerotized bulbs.

Male unknown.

Specimens examined.—Female and immature taken in Grutas de Cacahuamilpa, Guerrero, México, 15 August 1966 (J. Fish and J. Reddell) (TTU).

Comparisons.—See under *Schizomus* sp., OTU No. 2.

Distribution.—Known only from Grutas de Cacahuamilpa, Guerrero, México.

Table 1.--Comparisons of the New World species groups of the genus Schizomus. See Rowland and Reddell (1979) for explanation of characters.

CHARACTER	dumitrescoae	simonis	brasiliensis	mexicanus	pecki	goodnightorum	briggsi
DORSAL SETAE	2-3	2-3	3-4	2-3	2-3	3-4	3-4
METAPELTIDIUM	entire	entire	split or entire	entire	entire	entire	split or entire
COLOR	brown or green	brown or green	brown or green	brown or green	brown	brown	brown or green
SPERMATHECAE	M < L	M < L	M = L	M > L	M > L	M > L	multiple
ART. FEM. FLAGELLUM	4	4	3	3	3	3	4
CARAPACE LENGTH	.96-1.37	1.07-1.34	.91-1.48	.98-1.37	1.31-1.74	.89-1.42	1.18-1.52
ABDOMINAL ELONGATION	none	present	none	none	none	present	none or present
ABDOMINAL PROCESS	present	present	present	absent	absent	absent	present
PEDIPALPAL DIMORPHISM	slight to strong	none	slight to strong	none to strong	none	none	none to strong
SHAPE MALE FLAGELLUM	bulbous	long	bulbous	bulbous	bulbous	long	long or bulbous

Schizomus sp., OTU No. 2
Figs. 1, 41

Description.—Female. Color brownish. Carapace with two pairs of dorsal and two apical setae. Eyespots distinctly triangular. Anterior sternum with nine entire setae. Abdonimal terga I-VII with two setae, terga VIII-IX with four setae. Vestigial stigmata darker than sterna. Flagellum composed of three articles. Pedipalpal trochanter slightly produced distally; tarsal-basitarsal spurs about 1/4, claw about 1/2 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 31-4-5-6-5-6-15. Other leg segment measurements given in Table 3. Median spermathecae about 1/4 longer than laterals, both pair straight, slightly divergent, each with apical portions sclerotized.

Male unknown.

Specimens examined.—Female and immature taken 20 mi S. Juchatengo (6000 ft.), Oaxaca, México, 29 May 1971 (S. Peck) (TTU).

Comparisons.—This species appears to be closely related to OTU No. 1, but in OTU No. 2 the flagellum is shorter and the median spermathecae are nearly straight and have thicker apical spermathecal walls. The presence of only two setae on abdominal terga VIII, rather than four, separates this species from all other members of the *mexicanus* group.

Distribution.—Known only from 20 mi. S. Juchatengo, Oaxaca México.

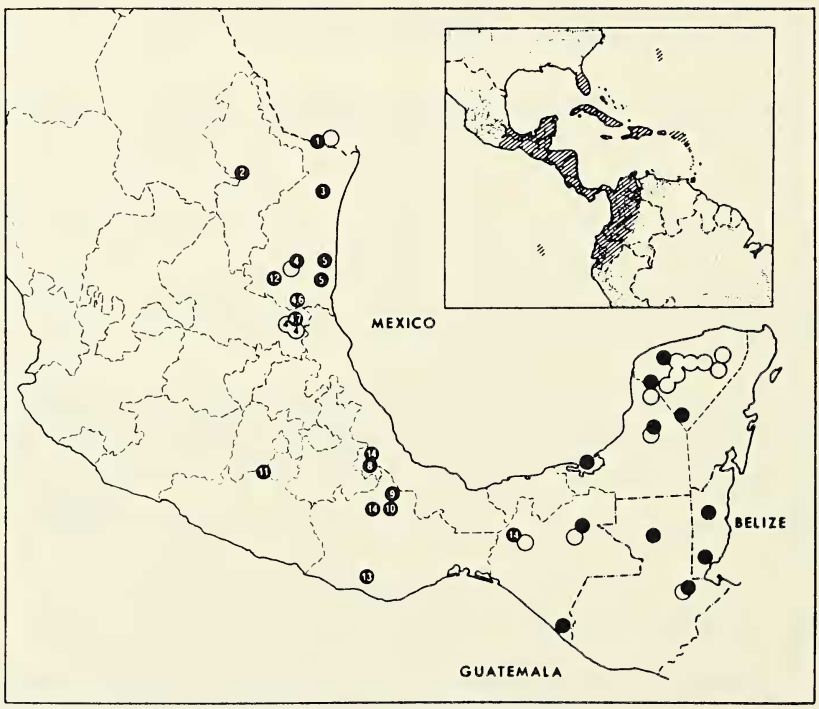


Fig. 1.—Map showing distribution of schizomids of the *mexicanus* group: 1, *S. mulaiki*; 2, *S. bartolo*; 3, *S. davisi*; 4, *S. mexicanus*; 5, *S. lukensi*; 6, *S. mitchelli*; 7, *S. cookei*; 8, *S. pallidus*; 9, *S. moisii*; 10, OTU No. 11; 11, OTU No. 1; 12, *S. reddelli*; 13, OTU No. 2; 14, unnumbered solid circles and inset, *S. portoricensis*.

Table 2.—Comparisons of members of the *mexicanus* group. See the introduction to Rowland and Reddell (1979a) for discussion of characters.

CHARACTER	OTU #1	OTU #2	mulaiki	bartolo	lukensi	davisi	reddelli	mexicanus	pallidus	portor-icensis	OTU #11	moisii	cookei	mitchelli
DORSAL SETAE	2	2	2	3	3	2	2	2	3	2	3	3	3	3
STERNAL SETAE	11	9	12	11	9	13	10	10	11	9	9	9	11	11
COLOR	brown	brown	brown	brown	brown	brown	brown	brown	brown	green or brown	green	green	brown	brown
PEDIPALPAL DIMORPHISM	?	?	none?	slight	slight	none?	none	none to strong	slight	none to slight	?	slight	strong	strong
EYESPOTS	absent	distinct	indis-tinct	absent	absent	indis-tinct	absent	indis-tinct	indis-tinct	indis-tinct to distinct	distinct	distinct	absent	absent
SPERMA-THECAE	M ±= L	M ±= L	?	M 2X L	M 10X L or laterals absent	?	laterals absent	M 1-2X L	M 2X L	M ±2x L	M 9X L	M 3X L	multiple	multiple
CARAPACE LENGTH	1.14	1.14	.98	1.04	1.34	1.18	1.13	1.11	1.44	1.07	.99	1.13	1.23	1.22
LENGTH FEM. FLAGELLUM	.37	.25	?	.28	.35	?	.30	.30	.45	.26	.24	.26	.37	.33
PIT MALE FLAGELLUM	?	?	single	absent	absent	double	double	double	double	double	?	double	single	single

Schizomus mulaiki Gertsch
Figs. 1, 8, 25

Schizomus mulaiki Gertsch 1940:1, 3-4; Rowland 1971b:304; Rowland and Reddell 1976:3; Rowland and Reddell 1977:79, 83.

Description.–Male. Color brownish. Carapace with two pairs of dorsal and two apical setae. Eyespots indistinct. Anterior sternum with 12 bifid setae Abdominal terga I-VII with two setae, terga VIII-IX with four setae, segment XII with no evidence of posterodorsal process. Vestigial stigmata darker than sterna. Flagellum nearly circular, the body wider than long, with a distal median depression. Pedipalpal trochanter not produced distally; tarsal-basitarsal spurs about 1/6, claw about 1/3 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 26-5-5-6-7-7-18. Other leg segment measurements given in Table 3.

Female unknown.

Type data.–Holotype male taken at Rio Grande City, Starr County, Texas, 21 June 1939 (S. Mulaik) (AMNH, examined); paratype male taken at Edinburg, Hidalgo County, Texas, 2 June 1935 (S. Mulaik) (AMNH, examined).

Comparisons.–*S. mulaiki* is very similar to other members of the *mexicanus* complex. It is distinct in having a small, single apical depression on the male flagellum. All other males within the group have either no dorsal relief or have a pair of distal depressions.

Distribution.–Known only from Hidalgo and Starr Counties in the Rio Grande Valley of Texas.

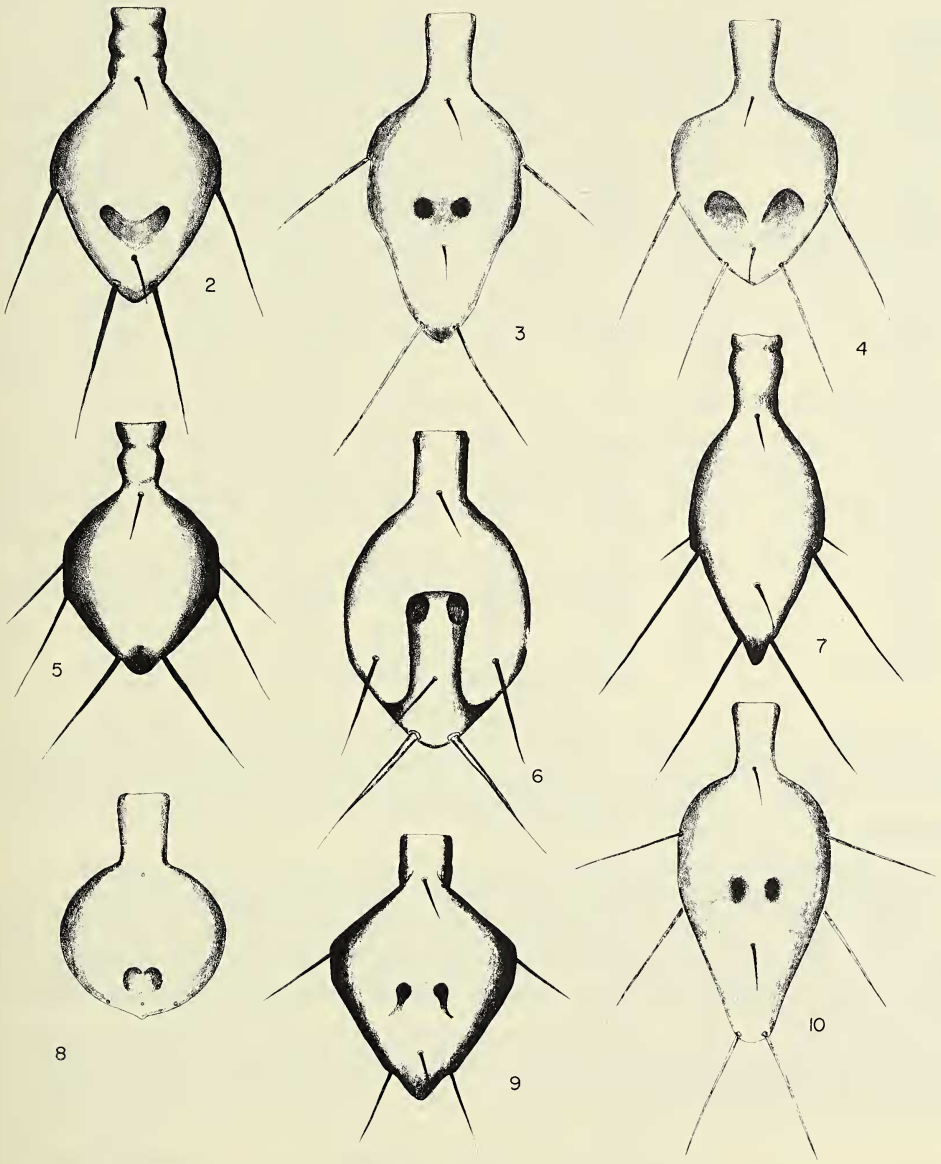
Remarks.–The morphology of the male flagellum was probably a result of a central fusion of the ancestral pair of depressions. A slight proximal cleavage of the pit is still apparent. Although this species is known only from the two type specimens, Stanley Mulaik (pers. comm.) stated that he has seen it all along the Rio Grande, perhaps 100 miles northwest of the type locality.

Schizomus bartolo Rowland
Figs. 1, 5, 21, 40

Schizomus sp.: Reddell 1967a:25; Reddell 1971b:28 [Grutas de San Bartolo record only].
Schizomus bartolo Rowland 1973a:13-16, 18; Rowland 1973c:135, 137; Dumitresco 1977:157; Rowland and Reddell 1977:80, 83, 84.

Description.–Male. Color pale brown. Carapace with three pairs of dorsal, the medians being very small, and two apical setae. Eyespots absent. Anterior sternum with 11 bifid setae. Abdominal terga I-VII with two setae, terga VIII-IX with four setae, segment XII with no evidence of posterodorsal process. Vestigial stigmata darker than sterna. Flagellum globose, with no dorsal relief. Pedipalpal trochanter produced distally; tarsal-basitarsal spurs about 1/4, claw about 1/2 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 38-7-7-7-10-9-20. Other leg segment measurements given in Table 3.

Female. Flagellum composed of three articles. Median spermathecae large, straight, wide, slightly convergent; laterals smaller, convergent and constricted into divergent curves apically, the medians apically sclerotized.



Figs. 2-10.–Dorsal views of male flagella of the *mexicanus* group: 2, 3, *S. mexicanus*: 2, from the type locality; 3, from Gómez Farías; 4, *S. davisi*; 5, *S. bartolo*; 6, *S. portoricensis* from Cueva Cerro Hueco, Chiapas; 7, *S. lukensi*; 8, *S. mulaiki*; 9, *S. moisii*; 10, *S. reddelli.*

Table 3.–Measurements (mm) of six species of the *mexicanus* group: 1, one female, OTU No. 1; 2, one female, OTU No. 2; 3, one male, *S. mulaiki*; 4, one male, *S. bartolo*; 5, one female, *S. bartolo*; 6, one male, *S. lukensi*; 7, one female, *S. lukensi*; 8, one male, *S. davisi*. Except as otherwise noted all measurements are of lengths.

	1	2	3	4	5	6	7	8
Carapace	1.14	1.14	0.98	0.99	1.04	1.14	1.34	1.18
Flagellum								
Length	0.37	0.25	0.26	0.33	0.28	0.45	0.35	0.35
Width	–	–	0.22	0.21	–	0.18	–	0.23
Leg I								
Femur	1.46	0.86	0.90	1.16	1.09	1.50	1.30	1.03
Patella	1.70	0.97	1.08	1.47	1.41	1.94	1.16	1.29
Tibia	1.28	0.73	0.83	1.13	1.11	1.49	1.25	0.97
Tarsus-Basitarsus	1.07	0.72	0.74	0.95	0.86	0.97	1.00	0.83
Leg II								
Femur	0.97	0.65	0.62	0.70	0.68	0.90	0.90	0.73
Patella	0.49	0.39	0.36	0.38	0.32	0.32	0.41	0.45
Tibia	0.50	0.40	0.40	0.50	0.53	0.57	0.62	0.46
Basitarsus	0.52	0.37	0.35	0.43	0.37	0.51	0.45	0.41
Leg III								
Femur	0.86	0.61	0.56	0.63	0.60	0.79	0.78	0.64
Patella	0.40	0.25	0.25	0.27	0.28	0.35	0.34	0.33
Tibia	0.57	0.32	0.33	0.41	0.38	0.53	0.53	0.36
Basitarsus	0.61	0.39	0.37	0.47	0.38	0.54	0.53	0.43
Leg IV								
Femur	1.31	0.97	0.84	1.05	1.00	1.22	1.19	0.97
Patella	0.47	0.44	0.35	0.35	0.36	0.47	0.42	0.46
Tibia	1.00	0.63	0.61	0.78	0.77	0.90	0.81	0.72
Basitarsus	0.93	0.58	0.52	0.68	0.68	0.79	0.74	0.60

Type data.–Holotype male, allotype female, and eight paratype immatures taken in Grutas de San Bartolo, 10 mi. SW Monterrey, Nuevo León, México, 21 June 1969 (S. and J. Peck) (AMNH, examined); four paratype females taken in Grutas de San Bartolo, September 1971 (T. Raines, TTU, examined).

Comparisons.–See under *S. lukensi.*

Distribution.–Known only from Grutas de San Bartolo, Nuevo León México.

Remarks.–This species is apparently a troglobite now isolated in Grutas de San Bartolo by the surrounding desert. Grutas de San Bartolo is a name applied to two adjacent caves, designated as Sur and Norte. It is not known from which cave the type series was taken.

Additional record.–*Nuevo León*: Gruta Sur de San Bartolo, February 1966 (B. Russell), four females, four immatures (AMNH).

Schizomus lukensi Rowland
Figs. 1, 7, 20, 38-39

Schizomus lukensi Rowland 1973c:136-137; Rowland 1975b:19, 20; Dumitresco 1977:157; Rowland and Reddell 1977:80, 83-84.

Description.–Male. Color pale brownish. Carapace with three pairs of dorsal and two apical setae. Eyespots absent. Anterior sternum with nine bifid setae. Abdominal terga

I-VII with two setae, terga VIII-IX with four setae, segment XII with no evidence of posterodorsal process. Vestigial stigmata lighter than sterna. Flagellum lanceolate, with no dorsal relief. Pedipalpal trochanter produced distally; tarsal-basitarsal spurs about 1/5, claw about 1/2 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 41-7-9-8-9-10-22. Other leg segment measurements given in Table 3.

Female. Flagellum composed of three articles. Spermathecae with medians extremely long, divergent, with slight terminal bulbs, only one very small lateral present.

Type data.–Holotype male, allotype female, and two male and two female paratypes taken in Cueva del Agua, 30 mi. SW Soto la Marina, Tamaulipas, México, 31 October 1970 (W. Russell, G. Ediger, J. Ediger) (AMNH, examined).

Comparisons.–*S. lukensi* shares with *S. bartolo* the possession of three pairs of dorsal carapacial setae and lack of dorsal relief on the male flagellum. The male flagellum, however, is longer and narrower in *S. lukensi* than in *S. bartolo*. Females of *S. lukensi* have only very small lateral spermathecae, whereas those of *S. bartolo* are well developed.

Distribution.–Known only from two caves in the Sierra de Tamaulipas, Tamaulipas, México.

Remarks.–Specimens from Cueva de los Cuarteles, near Aldama, Tamaulipas, México, are very similar to *S. lukensi* (Fig. 39). The female spermathecae differ, however, in completely lacking the laterals. The male flagella, also, show slight but consistent differences between the two populations and they probably should be considered distinct species.

Additional record.–*Tamaulipas*: Cueva de la Virgen de Guadalupe, 48 km SW Soto la Marina, 31 October 1970 (W. Russell, G. Ediger, J. Ediger), 1 female (TTU).

Schizomus davisi Gertsch

Figs. 1, 4, 24, 58

Schizomus davisi Gertsch 1940:1-4; Rowland 1971a:117; Rowland 1973a:21; Rowland 1973c:135; Brignoli 1974:149; Rowland and Reddell 1977:83.

Description.–Male. Color brownish. Carapace with three pairs of dorsal and two apical setae. Eyespots indistinct. Anterior sternum with 13 bifid setae. Abdominal terga I-VII with two setae, terga VIII-IX with four setae, segment XII without evidence of posterodorsal process. Vestigial stigmata darker than sterna. Flagellum spade shaped, with a pair of deep depressions undercutting a dorsal medially produced ridge. Pedipalpal trochanter produced apically into a tubercle which bears an apical spine; tarsal-basitarsal spurs about 1/5, claw about 1/2 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 28-6-7-6-8-9-19. Other leg segment measurements given in Table 3.

Female unknown.

Type data.–Holotype male taken at San Fernando, Tamaulipas, México 28 March 1937 (L. Irby Davis) (AMNH, examined).

Comparisons.–*S. davisi* is closely related to *S. mexicanus* and *S. mulaiki*. It may be readily distinguished from *S. mulaiki* by the presence of one small distal depression in *S. mulaiki* rather than two depressions. The distal pits are better defined in *S. davisi* than in *S. mexicanus*. The pedipalps of *S. davisi* are shorter and thicker than are those of *S. mexicanus* and the trochanter of *S. davisi* has an apical spine absent in *S. mexicanus*.

Table 4.–Measurements (mm) of four species of the *mexicanus* group: 1, one male, *S. reddelli*; 2, one female, *S. reddelli*; 3, nine males, *S. mexicanus*; 4, 12 females, *S. mexicanus*; 5, two males, *S. pallidus*; 6, one female, *S. pallidus*; 7, one female, OTU No. 11. Except as otherwise noted all measurements are of lengths.

	1	2	3	4	5	6	7
Carapace	1.12	1.13	1.14–1.28	1.20–1.31	1.21–1.37	1.44	0.99
Flagellum							
Length	0.49	0.30	0.39–0.40	0.31–0.35	0.49–0.53	0.45	0.24
Width	0.20	–	0.20–0.22	–	0.25–0.26	–	–
Leg I							
Femur	1.13	1.02	1.23–1.39	1.10–1.20	1.64–1.86	1.73	0.85
Patella	1.57	1.26	1.43–1.71	1.33–1.42	2.11–2.12	2.08	0.97
Tibia	1.13	0.90	1.05–1.61	0.94–1.02	1.52–1.53	1.60	0.71
Tarsus-Basitarsus	1.02	0.81	0.92–0.97	0.84–0.97	1.20–1.22	1.11	0.67
Leg II							
Femur	0.82	0.73	0.90–0.97	0.82–0.86	1.07–1.09	1.15	0.59
Patella	0.40	0.41	0.49–0.54	0.45–0.48	0.52–0.59	0.63	0.34
Tibia	0.59	0.47	0.62–0.67	0.55–0.59	0.80–0.80	0.80	0.35
Basitarsus	0.48	0.39	0.48–0.52	0.43–0.49	0.55–0.58	0.62	0.35
Leg III							
Femur	0.70	0.64	0.80–0.82	0.74–0.89	0.97–0.99	1.06	0.54
Patella	0.29	0.30	0.31–0.40	0.35–0.49	0.46–0.61	0.45	0.23
Tibia	0.44	0.37	0.47–0.50	0.42–0.59	0.59–0.78	0.62	0.26
Basitarsus	0.48	0.44	0.54–0.58	0.48–0.51	0.63–0.65	0.68	0.35
Leg IV							
Femur	1.05	1.02	1.22–1.30	1.15–1.21	1.50–1.53	0.81	0.87
Patella	0.38	0.40	0.52–0.59	0.50–0.54	0.60–0.64	0.62	0.41
Tibia	0.81	0.71	0.89–0.92	0.78–0.87	1.09–1.11	1.21	0.57
Basitarsus	0.75	0.62	0.77–0.82	0.70–0.76	0.93–0.95	1.00	0.54

Distribution.–known only from the type locality.

Remarks.–This species is probably a relict of a once widely distributed common ancestor of *S. mexicanus, S. reddelli, S. lukensi, S. bartolo*, and *S. mulaiki*. The specimen was probably collected near the banks of the Río San Fernando, since other areas surrounding San Fernando seem quite xeric and thus unsuited for schizomids.

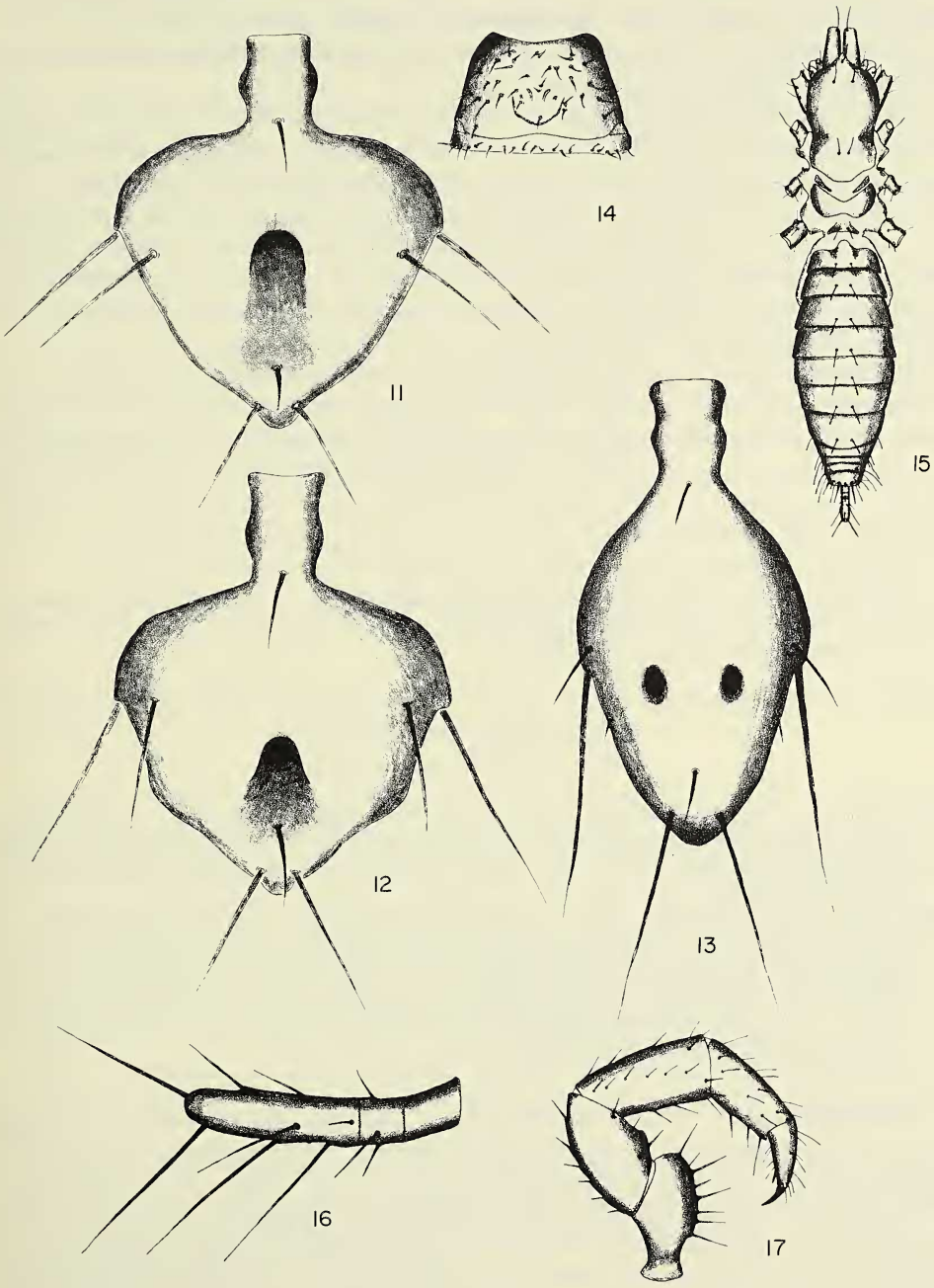
Schizomus reddelli Rowland
Figs. 1, 10, 22, 36-37

Schizomus reddelli Rowland 1971a:123, 124, 126; Reddell and Mitchell 1971b:185; Rowland 1973a:21; Rowland 1973c:135; Reddell 1973:38; Brignoli 1974:147, 149; Rowland and Reddell 1977:80, 84, 85.

Schizomus mexicanus: Reddell and Mitchell 1971b:185 [misidentification]; Vomero 1974:341 [misidentification].

Schizomus reddeli: Dumitresco 1977:157 [erroneous spelling].

Description.–Male. Color brownish. Carapace with two pairs of dorsal and two apical setae. Eyespots absent or only very indistinct. Anterior sternum with 10 bifid setae. Abdominal terga I-VII with two setae, terga VIII-IX with four setae, segment XII without evidence of posterodorsal process. Vestigial stigmata darker than sterna. Flagellum



Figs. 11-17–Parts of schizomids of the *mexicanus* group: 11-13, dorsal views of male flagella: 11, *S. mitchelli*; 12, *S. cookei*; 13, *S. pallidus*; 14-17, female *S. portoricensis*: 14, ventral view of abdominal sterna II and III, showing spermathecae through the integument; 15, dorsal view, legs and pedipalps past the trochanter omitted; 16, lateral view of flagellum; 17, lateral view of right pedipalp.

lanceolate, with faint depressions medially, nearly flat dorsally. Pedipalpal trochanter produced slightly distally; tarsal-basitarsal spurs about 1/5, claw about 1/2 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 37-7-9-8-10-10-20. Other leg segment measurements given in Table 4.

Female. Flagellum composed of three articles. Lateral spermathecae missing; medians long, thin, and slightly curved outward.

Type data.—Holotype male taken in Cueva de Tres Manantiales, 8 km NNE Chamal, Tamaulipas, México, 27 May 1968 (J. Reddell) (AMNH, examined); allotype female taken in Cueva de Tres Manantiales, January 1972 (W. Russell) (TTU, examined).

Comparisons.—*S. reddelli* is generally larger than *S. mexicanus*. Females of *S. reddelli* have a single pair of spermathecae, while those of *S. mexicanus* have both pair. While the morphology of the male flagellum in *S. mexicanus* is, in most cases, distinct from *S. reddelli*, a variant from near Gómez Farías, Tamaulipas, shows striking similarity to that of *S. reddelli*. See also under *S. mexicanus*.

Distribution.—Known only from two caves near Chamal, Tamaulipas, México .

Remarks.—Although the male flagellum is usually the best character to be used in species recognition, the similarity of the flagella of a population of *S. mexicanus* from Gómez Farías to that of typical *S. reddelli* makes this character less reliable than the female spermathecae in distinguishing these two closely related species. *S. reddelli* is probably a high altitude relict of a formerly widely ranging population ancestral to it and *S. mexicanus*. This species is probably now restricted to the cave environment.

Additional records.—*Tamaulipas*: Cueva de Tres Manantiales, January 1972 (W. Russell), one female, one immature (TTU); Cueva de los Vampiros, 6 mi. NNE Chamal, 27 May 1968 (J. Reddell), one male, three females, five immatures (TTU).

Schizomus mexicanus Rowland
Figs. 1-3, 18-19, 32-34, 54-57

Schizomus sp.: McKenzie 1965:35, 37; Reddell 1967b:82; Reddell 1971b:28 [Cueva Grande and Ventana Jabalí records only]; Reddell and Mitchell 1971a:145; Reddell and Elliott 1973:183.

Schizomus mexicanus Rowland 1971a:117-119; Reddell and Mitchell 1971a:145; Rowland 1973a:10, 21, 22; Rowland 1973b:200-201; Rowland 1973c:135, 137; Brignoli 1973:6; Reddell 1973:38; Reddell and Elliott 1973:183; Brignoli 1974:143, 146-147, 149, 151; Vomero 1974:341, 345; Rowland 1975b:15, 19, 20; Rowland and Reddell 1977:80, 83, 85, 86, 87, 96.

Description.—Male. Color brownish. Carapace with two pairs of dorsal and two apical setae. Eyespots indistinct. Anterior sternum with 10 bifid setae. Abdominal terga I-VII with two setae, terga VIII-IX with four setae, segment XII with no evidence of posterodorsal process. Vestigial stigmata darker than sterna. Flagellum ovoid, with a pair of subdistal pits. Pedipalpal trochanter produced apically slightly; other segments elongate; the tibia with a jutting spur apposible to the tarsus-basitarsus; tarsal-basitarsal spurs about 1/5, claw about 1/3 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 45-8-10-9-10-10-27. Other leg segment measurements given in Table 4.

Female. Flagellum composed of three articles. Median and lateral spermathecae outwardly divergent, medians somewhat larger than laterals, slightly expanded and sclerotized apically.

Type data.–Holotype male, allotype female, and paratype male and female taken in Sótano de la Tinaja, 10 km NNE Ciudad Valles, San Luis Potosí, México, 18 February 1970 (J. A. L. Cooke) (AMNH, examined).

Comparisons.–*S. mexicanus* is most closely related to *S. reddelli* and *S. davisi*. The trochanter of the pedipalp of the male of *S. davisi* is greatly produced, whereas it is only slightly produced in *S. mexicanus*. The dorsal depressions on the male flagellum are more distinct and proximal in *S. davisi* than in *S. mexicanus*. The flagellum of the male of *S. reddelli* is longer than that of typical *S. mexicanus*. *S. reddelli* also lacks definition of a median depression, but a population of *S. mexicanus* from near Gómez Farías, Tamaulipas, also lacks a well-defined median depression. Females of *S. reddelli* lack the lateral spermathecae, which are always present in *S. mexicanus*.

Distribution.–*S. mexicanus* occurs in epigean and subterranean habitats in the Sierra de El Abra, San Luis Potosí and Tamaulipas; and in the Sierra de Guatemala, Tamaulipas.

Variation.–Two males from the Gómez Farías roadcut have an elongated flagellum unlike that observed elsewhere in the range of the species. Females from the same locality are identical to those from the type locality. The pedipalps of the male are strongly sexually dimorphic in cave populations, but are more similar in epigean populations.

Additional records.–See Rowland and Reddell (1977) for other records.

Schizomus pallidus Rowland
Figs. 1, 13, 26, 43

Schizomus pallidus Rowland 1975b:7, 13-15, 17; Rowland and Reddell 1977:80, 84, 87, 88, 89.

Description.–Male. Color pale brownish. Carapace with three pairs of dorsal, the medians very small, and two apical setae. Eyespots indistinct. Anterior sternum with 11 bifid setae. Abdominal terga I-VII with two setae, terga VIII-IX with four setae, segment XII with no evidence of posterodorsal process. Vestigial stigmata darker than sterna. Flagellum lanceolate, with a pair of median depressions. Pedipalpal trochanter produced distally; tarsal-basitarsal spurs about 1/5, claw about 1/2 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 56-10-12-10-11-12-26. Other leg segment measurements given in Table 4.

Female. Flagellum composed of three articles. Median and lateral spermathecae divergent, the medians about twice as long as laterals; both pairs evenly sclerotized along length.

Type data.–Male holotype and female allotype taken in Cueva Macinga, Tlilapan, Veracruz, México, 5 March 1973 (J. Reddell) (AMNH, examined); one male, two female, and two immature paratypes taken with the holotype (TTU, examined).

Comparisons.–See under *S. portoricensis*.

Distribution.–Known only from the type locality.

Remarks.–The large size and reduction of pigmentation in this species indicates that it is probably a troglobite which has not yet completely lost the eyespots. Specimens were taken from beneath rocks on silt in a small side passage.

Additional record.–*Veracruz*: Cueva Macinga, 9 January 1977 (J. Reddell, A. Grubbs, D. McKenzie, C. Soileau), 1 female, 3 immatures (TTU).

Schizomus portoricensis (Chamberlin)
Figs. 1, 6, 14-17, 28, 46-53.

Stenochrus portoricensis Chamberlin 1922:11-12; Mello-Leitão 1931:19; Giltay 1935:8; Werner 1935:469; Takashima 1943:93; Rowland 1973b:195, 197, 200; Brignoli 1974:145.

Schizomus antilus Hilton 1933:91-92; Giltay 1935:6; Takashima 1943:94. **Possible synonymy.**

Schizomus cavernicolens Chamberlin and Ivie 1938:102, 103; Gertsch 1940:4; Takashima 1943:94; Pearse 1945:153; Cárdenas Figueroa 1950:154; Nicholas 1962:181; Vandel 1964:116; Vandel 1965:93; Reddell 1971b:28; Rowland 1971a:117; Brignoli 1974:149; Reddell, 1977:230.

Schizomus probably *latipes* Hansen (in Hansen and Sörensen): Cloudsley-Thompson 1949:261 [misidentification].

Schizomus floridanus Muma 1967:18-20; Rowland 1971b:304.

Schizomus longimanus Rowland 1971a:118-120; Reddell 1973:38; Rowland 1973a:13; Rowland 1973c:135, 137; Brignoli 1973:6, 7, 8, 9; Brignoli 1974:143, 144, 146, 147, 151; Rowland 1975b:15, 17, 19, 20; Dumitresco 1977:157.

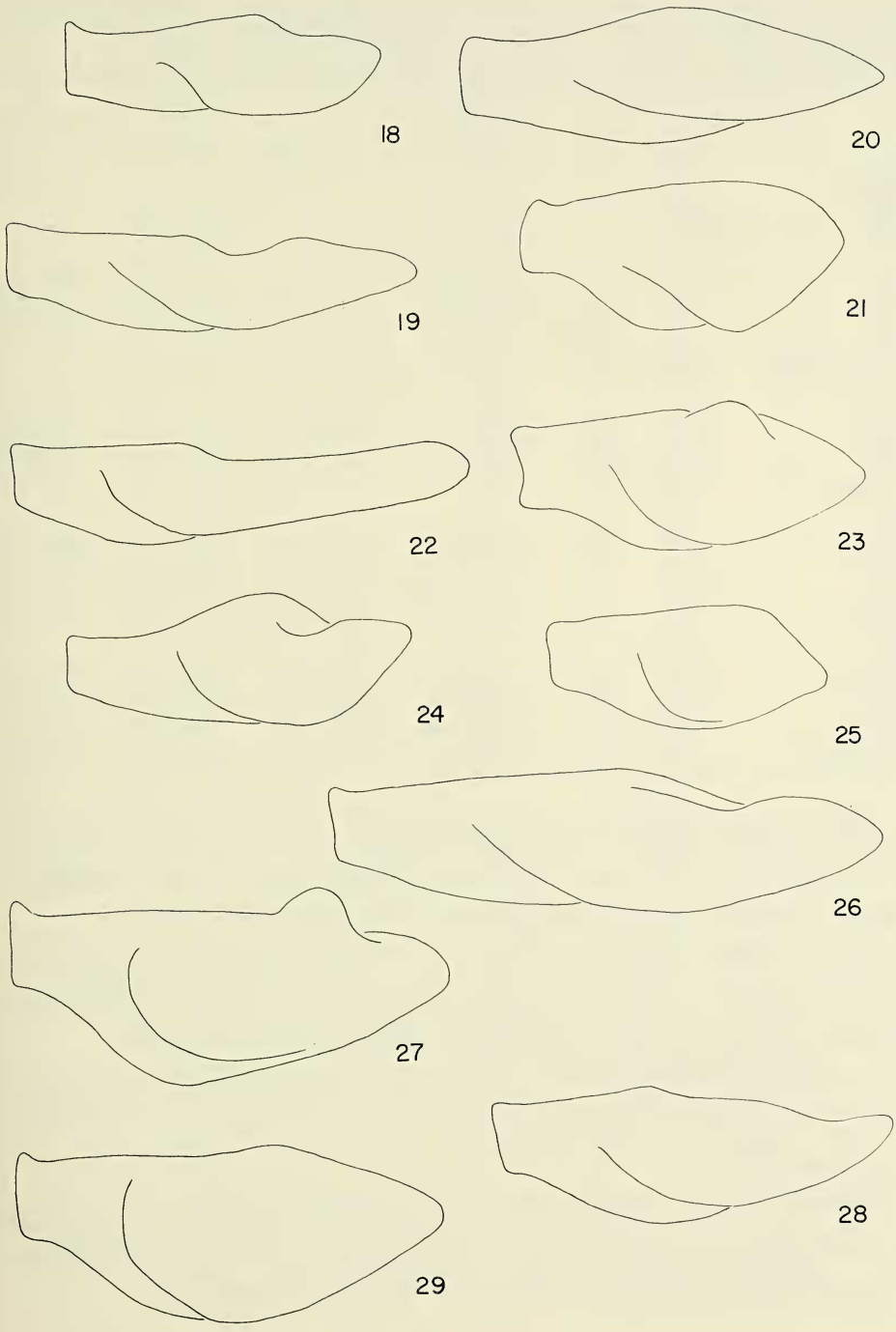
Schizomus portoricensis: Rowland 1973b:197; Rowland and Reddell 1977:79, 80, 87-95; Reddell, 1977:230.

Description (male and female from 1 km S Muna, Yucatán, México).—Male. Color brownish green. Carapace with two pairs of dorsal and two apical setae. Eyespots distinct, vaguely triangular. Anterior sternum with nine bifid setae; posterior sternum with bifid setae. Abdominal terga I-VII with two setae, terga VIII-IX with four setae, segment XII with no evidence of posterodorsal process. Vestigial stigmata slightly darker than sterna. Flagellum ovoid, with a pair of median depressions. Pedipalpal trochanter produced distally, other segments slightly elongate. Tarsal-basitarsal spurs about 1/7, claw about 1/3 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 49-6-8-8-8-8-18. For other leg segment measurements see Rowland and Reddell (1977, Table 1).

Female. Females differ from the males in the following respects: flagellum with three sections; pedipalps not elongate; first legs noticeably shorter; eyespots less distinct; color less greenish. Spermathecae with median and lateral lobes outwardly divergent; medians heavily sclerotized along entire length; laterals much reduced and weakly sclerotized.

Type data.—Of *Stenochrus portoricensis*: holotype female and several paratype females taken at Coamo Springs, Puerto Rico, November 1889 (MCZ, examined); of *Schizomus antilus*: female types taken at Corall [Corral] Nuevo (1500 ft.) and near Havana, Cúba (reportedly deposited in the Pomona College, California, collection, but not located); of *Schizomus cavernicolens*: female holotype taken in Xkyc Cave [=Actún Xkyc], Calcehtok, Yucatán, México, 6 August 1936 (A. S. Pearse) (AMNH, examined); of *Schizomus floridanus*: female holotype taken at Ross and Castellow Hammock, Dade County, Florida, United States (AMNH, examined); of *Schizomus longimanus*: male holotype and female allotype taken in Cueva Cerro Hueco, 3 km SE Tuxtla Gutiérrez, Chiapas, México, 18 August 1967 (J. Reddell, J. Fish, M. Tandy) (AMNH, examined).

Comparisons.—*S. portoricensis* is most similar to and cladistically most proximal to *S. pallidus*. The flagellum is similar in males of the two species, but is longer in *S. pallidus* (0.53 mm) than in *S. portoricensis* (0.42 mm). The females are separable on the basis of



Figs. 18-29.–Lateral views of male flagella of the *mexicanus* group: 18, 19, *S. mexicanus*: 18, from the type locailty; 19, from Gómez Farías; 20, *S. lukensi*; 21, *S. bartolo*; 22, *S. reddelli*; 23, *S. moisii*; 24, *S. davisi*; 25, *S. mulaiki*; 26, *S. pallidus*; 27, *S. cookei*; 28, *S. portoricensis* from Cueva Cerro Hueco, Chiapas; 29, *S. mitchelli.*

Table 5.–Measurements (mm) of three species of the *mexicanus* group: 1, one male, *S. moisii*; 2, one female, *S. moisii*; 3, two males, *S. cookei*; 4, three females, *S. cookei*; 5, eight males, *S. mitchelli*; 6, 12 females, *S. mitchelli*. Except as otherwise noted all measurements are of lengths.

	1	2	3	4	5	6
Carapace	1.04	1.13	1.12–1.16	1.17–1.23	1.04–1.16	1.04–1.16
Flagellum						
Length	0.37	0.26	0.43–0.45	0.37–0.38	0.40–0.45	0.28–0.31
Width	0.26	–	0.45–0.45	–	0.35–0.39	–
Leg I						
Femur	1.32	1.11	1.14–1.32	1.09–1.18	1.10–1.24	0.98–1.05
Patella	1.78	1.42	1.37–1.55	1.34–1.39	1.34–1.49	1.12–1.24
Tibia	1.30	1.00	1.03–1.15	1.02–1.07	1.02–1.09	0.87–0.92
Tarsus-Basitarsus	0.95	0.86	0.92–0.97	0.81–0.89	0.87–0.95	0.76–0.81
Leg II						
Femur	0.78	0.70	0.84–0.96	0.79–0.90	0.74–0.82	0.69–0.76
Patella	0.42	0.37	0.45–0.51	0.44–0.50	0.42–0.49	0.39–0.44
Tibia	0.52	0.46	0.59–0.66	0.49–0.59	0.51–0.58	0.41–0.49
Basitarsus	0.50	0.44	0.50–0.52	0.45–0.54	0.48–0.48	0.34–0.43
Leg III						
Femur	0.62	0.67	0.74–0.80	0.76–0.78	0.68–0.74	0.61–0.68
Patella	0.28	0.31	0.30–0.39	0.35–0.39	0.30–0.34	0.29–0.32
Tibia	0.35	0.41	0.41–0.49	0.44–0.48	0.38–0.45	0.31–0.38
Basitarsus	0.40	0.42	0.51–0.57	0.51–0.55	0.45–0.52	0.42–0.45
Leg IV						
Femur	1.18	1.06	1.09–1.24	1.13–1.13	1.04–1.17	0.97–1.05
Patella	0.51	0.43	0.41–0.49	0.46–0.51	0.45–0.50	0.41–0.47
Tibia	0.82	0.80	0.82–0.90	0.84–0.89	0.74–0.83	0.69–0.77
Basitarsus	0.67	0.65	0.71–0.83	0.70–0.76	0.65–0.72	0.59–0.64

the flagellum also, which is longer in *S. pallidus* (0.45 mm) than in *S. portoricensis* (0.30 mm). The carapacial length in both sexes of *S. pallidus* is about 1.4 mm while that of *S. portoricensis* is about 1.25 mm at most, and is usually about 1.05 mm. *S. pallidus* has three pairs of dorsal carapacial setae, whereas *S. portoricensis* has two pairs.

Within its range in México *S. portoricensis* can always be distinguished by its two pairs of dorsal carapacial setae and small size. The only other Mexican species with only two pairs of dorsal setae (*S. pecki* Rowland and *Schizomus* sp., OTU No. 7 from Las Ruinas de Palenque, Chiapas) are large, with a carapacial length in excess of 1.5 mm.

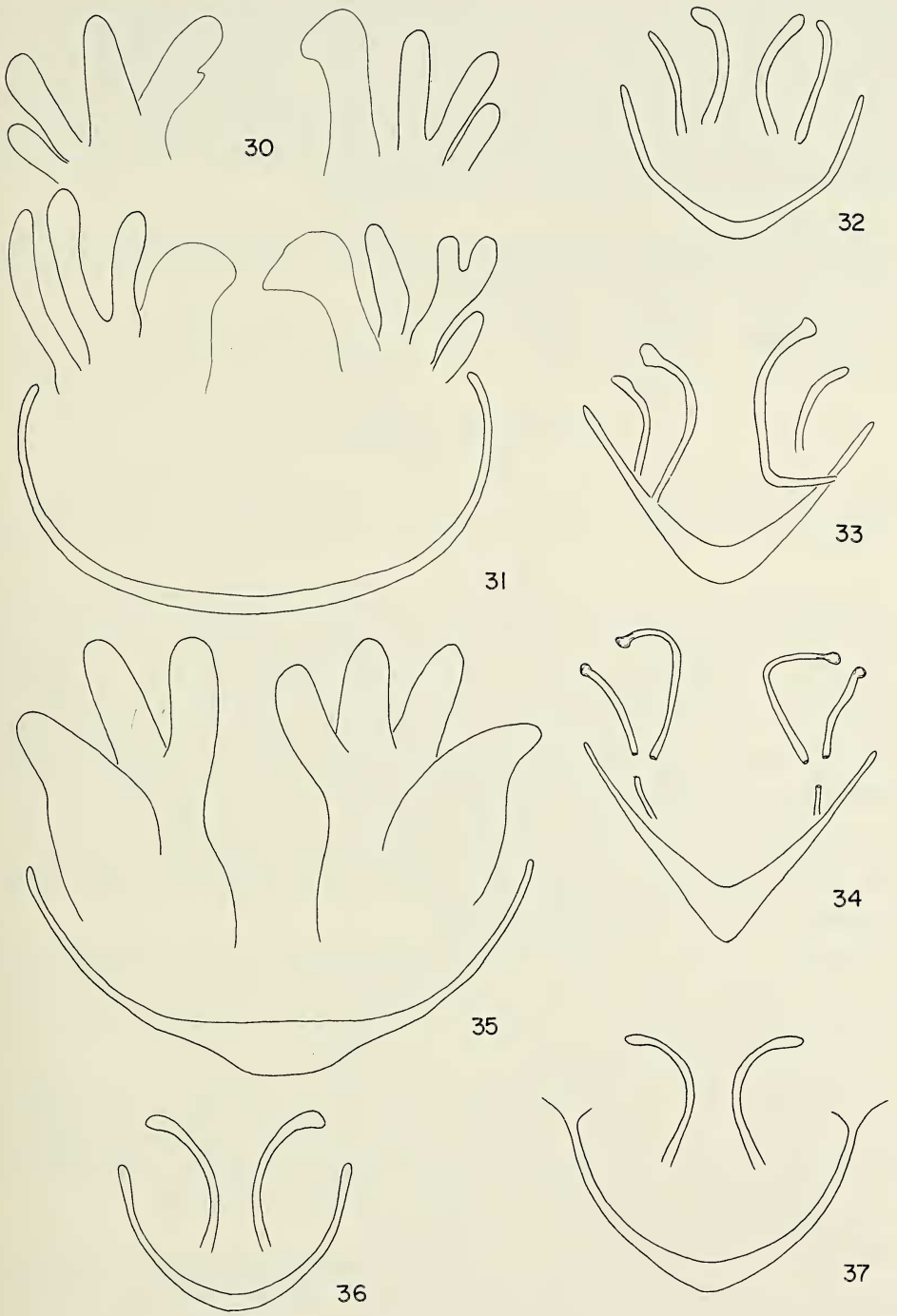
The median spermathecal lobes of this species are heavily sclerotized and are visible without dissection through the genital sternite. No other species in the *mexicanus* group for which females are known possesses so heavy a sclerotization of the median spermathecal lobes.

Distribution.–Known from Bermuda, Florida, Campeche, Chiapas, Oaxaca, Veracruz, Yucatán, Quintana Roo, Belize, Guatemala, Nicaragua, Cúba, Dominica, Jamaica, Puerto Rico, Virgin Islands, Colombia, Ecuador, Galapagos Islands, and England (introduced).

Remarks, Variation, and Additional Records.–See Rowland and Reddell (1977).

Schizomus sp., OTU No. 11
Figs. 1, 42

Description.–Female. Color brownish green. Carapace with three pairs of dorsal and two apical setae. Eyespots distinct. Anterior sternum with nine bifid setae. Abdominal



Figs. 30-37.–Female spermathecae of the *mexicanus* group: 30, 31, *S. cookei*; 32-34, *S. mexicanus* from various localities: 32, Nacimiento del Río Frío, Tamaulipas; 33, Cueva Chica, San Luis Potosí; 34, the type locality; 35, *S. mitchelli*; 36, 37, *S. reddelli*: 36, from Cueva de los Vampiros, Tamaulipas; 37, from the type locality.

terga I-VII with two setae, terga VIII-IX with four setae. Vestigial stigmata darker than sterna. Flagellum composed of three sections. Pedipalpal trochanter slightly produced distally; tarsal-basitarsal spurs about 1/5, claw about 1/2 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 28-4-5-5-5-6-14. Other leg segment measurements given in Table 4. Median spermathecae almost horizontally divergent, extremely long, lateral spermathecae short, dome shaped; medians terminate in poorly defined sclerotized bulbs.

Male unknown.

Specimens examined.—Female and immature taken 6 mi. S Valle Nacional, Oaxaca, México (2,000 ft.), 19 May 1971 (S. Peck) (TTU).

Comparisons.—See under *S. moisii.*

Distribution.—Known only from 6 mi. S Valle Nacional, Oaxaca, México.

Schizomus moisii Rowland
Figs. 1, 9, 23, 44

Schizomus moisii Rowland 1973c:136, 137-139, 140; Rowland and Reddell 1977:80, 86, 95-96, 99.

Description.—Male. Color brownish green. Carapace with three pairs of dorsal and two apical setae. Eyespots distinct. Anterior sternum with nine bifid setae. Abdominal terga I-VII with two setae, terga VIII-IX with four setae, segment XII with no evidence of posterodorsal process. Vestigial stigmata darker than sterna. Flagellum diamond shaped, with a pair of median depressions flanked laterally by a pair of swellings. Pedipalpal trochanter produced distally; tarsal-basitarsal spurs about 1/5, claw about 1/2 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 44-7-8-7-7-9-16. Other leg segment measurements given in Table 5.

Female. Flagellum composed of three sections. Spermathecae with medians three times longer, but somewhat thinner, than laterals, the latter being dome shaped; medians terminate in a poorly defined sclerotized bulb.

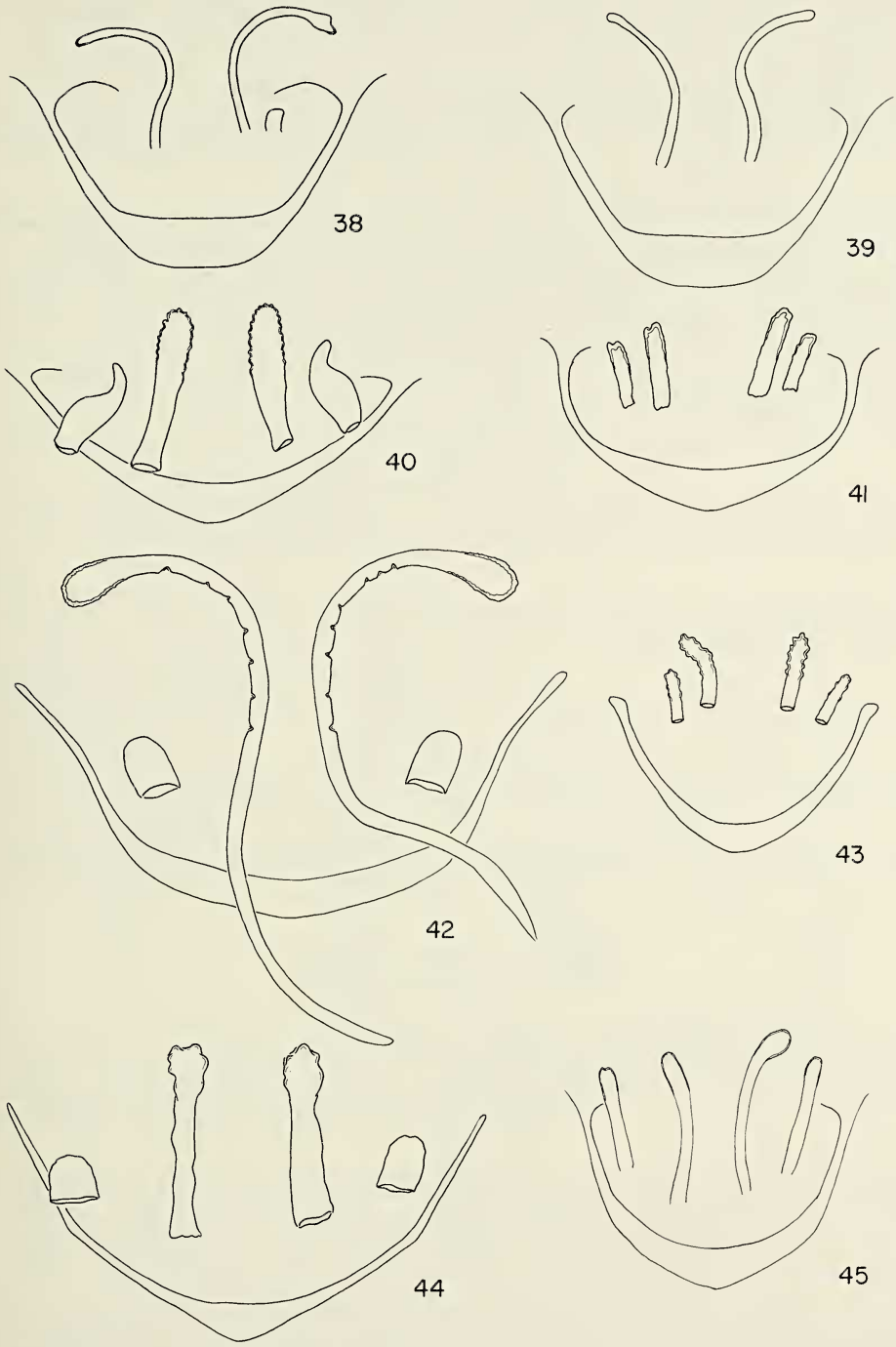
Type data.—Holotype male and allotype female taken in Grutas de Monteflor, 6 km NE Valle Nacional, Oaxaca, México, 28 December 1972 (J. Reddell, D. McKenzie, S. Murphy) (AMNH, examined); five male, five female, and one immature paratypes taken with the holotype (TTU, examined).

Comparisons.—*S. moisii* and its closest relative, OTU No. 11, are distinct from other members of the *mexicanus* group in that they possess a combination of three pairs of dorsal carapacial setae, distinct eyespots, greenish coloration, and short, wide lateral spermathecae. *S. moisii* has straight, short, thick median spermathecae, whereas OTU No. 11 has apically outwardly divergent, very long, and relatively thin medians.

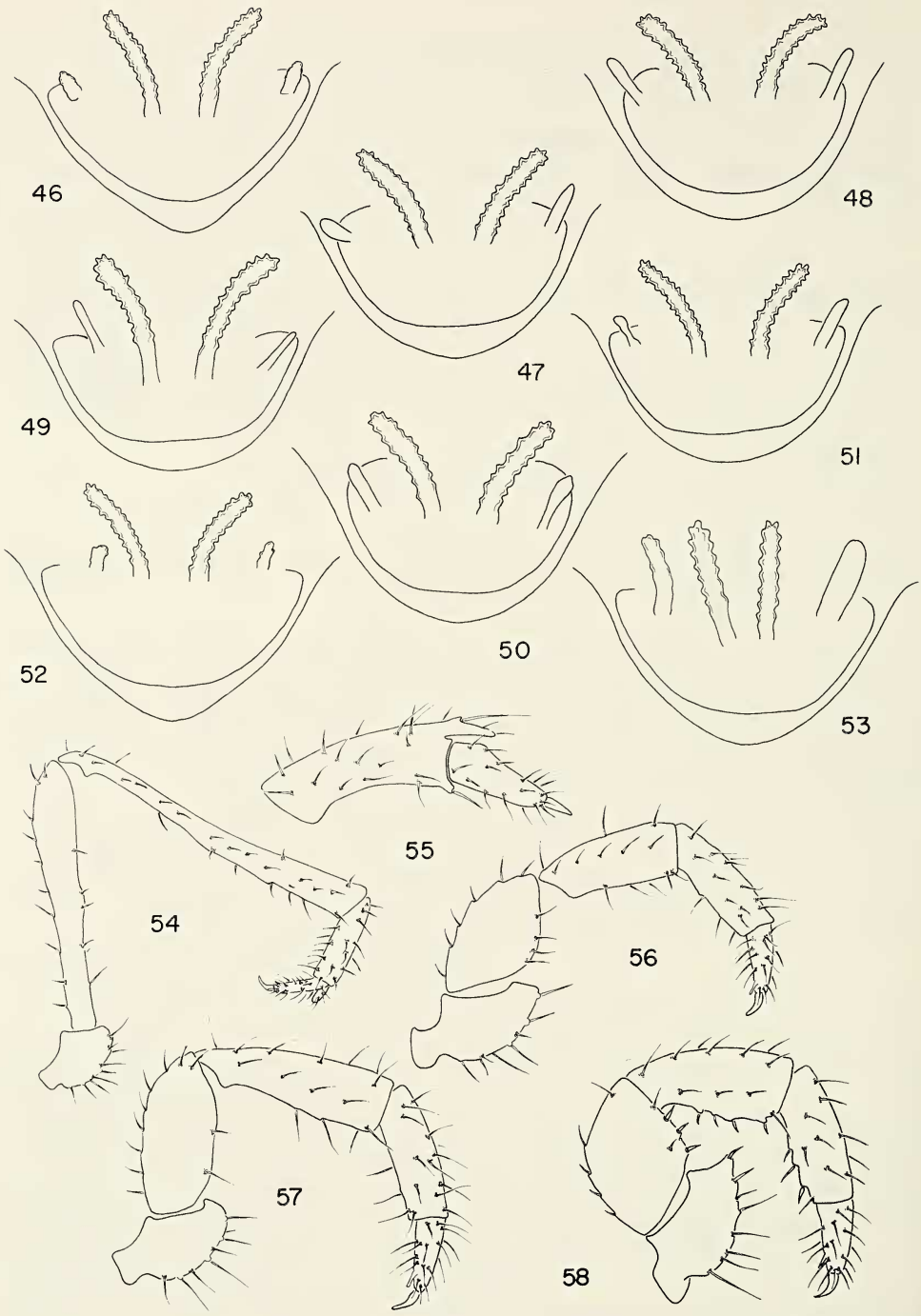
Distribution.—Known only from the type locality.

Remarks.—The dark pigmentation and distinct eyespots indicate that this species is a facultative troglophile and should be found in epigean habitats in the vicinity of the cave. It inhabits Grutas de Monteflor with OTU No. 8, a member of the *pecki* group.

Variation.—The apex of the carapace of the holotype is typical of other schizomids; however, two of the paratypes show variation in this character unlike any we have seen before. These specimens have a truncate margin at the apex of the carapace rather than the typical conical process. There is also only one apical seta rather than the usual two, with the distal seta probably being lost. The significance of this variation is unknown.



Figs. 38-45.–Female spermathecae of the *mexicanus* group: 38, *S. lukensi*; 39, *S.* sp. nr. *lukensi*, from Cueva de los Cuarteles, Tamaulipas; 40, *S. bartolo*; 41, OTU No. 2; 42, OTU No. 11; 43, *S. pallidus*; 44, *S. moisii*; 45, OTU No. 1.



Figs. 46-58.—Parts of schizomids of the *mexicanus* group: 46-53, female spermathecae of *S. portoricensis* from various localities: 46, the type locality; 47, Cave Bellamar, Cúba; 48, St. Catherine Parish, Jamaica; 49, Dade County, Florida; 50, Guayaquil, Ecuador; 51, Santa Cruz Island, Galapagos Islands; 52, Actún Xkyc, Yucatán; 53, Cueva Cerro Hueco, Chiapas; 54-58, male pedipalps: 54-57, *S. mexicanus* from various localities: 54, right, lateral view from the type locality; 55, dorsal view of tibia and tarsus-basitarsus from the type locality; 56, right, lateral view from Gómez Farías, Tamaulipas; 57, right, lateral view from Sótano del Tigre, San Luis Potosí; 58, right, lateral view of *S. davisi.*

Schizomus cookei Rowland
Figs. 1, 12, 27, 30-31

Schizomus cookei Rowland 1971a:122-123; Reddell and Mitchell 1971a:145; Dumitresco 1973:291; Reddell 1973:38; Rowland 1973c:135; Brignoli 1974:146; Rowland and Reddell 1977:80, 84, 85, 96.

Description.–Male. Color brownish. Carapace with three pairs of dorsal and two apical setae. Eyespots absent. Anterior sternum with 11 bifid setae. Abdominal terga I-VII with two setae, terga VIII-IX with four setae, segment XII with no evidence of posterodorsal process. Vestigial stigmata very much darker than sterna. Flagellum triangular, with a median pit flanked by lateral swellings. Pedipalpal trochanter produced distally; other segments elongate; the tibia with large spur apposible to tarsus-basitarsus; the latter emarginate with spurs about 1/8, claw about 1/3 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate propotions: 35-6-8-7-9-10-22. Other leg segment measurements given in Table 5.

Female. Flagellum composed of three articles. Spermethecae composed of four or five lobes, the medians possibly trifurcate, the terminations not sclerotized, the medians the largest.

Type data.–Holotype male, allotype female, and male and female paratypes taken in El Sótano de la Tinaja, 10 km NNE Ciudad Valles, San Luis Potosí, México, 19 February 1970 (J. A. L. Cooke) (AMNH, examined).

Comparisons.–See under *S. mitchelli.*

Distribution.–This species is known only from two caves north of Ciudad Valles, San Luis Potosí, México.

Remarks.–This troglobitic species occurs sympatrically with *S. mexicanus* and *Agastochizomus lucifer.*

Additional record.–*San Luis Potosí*: Sótano de Yerbaniz, 22.5 km N Ciudad Valles, 8 January 1971 (W. Elliott), one female (TTU, examined).

Schizomus mitchelli Rowland
Figs. 1, 11, 29, 35, 59-62

Schizomus mitchelli Rowland 1971a:121-122; Reddell and Mitchell 1971a:145; Brignoli, 1973:6, Reddell 1973:38; Rowland 1973c:135; Brignoli 1974:145-146; Dumitresco 1977:157; Rowland and Reddell 1977:80, 84, 85, 96.

Description.–Male. Color brownish. Carapace with three pairs of dorsal and two apical setae. Eyespots absent. Anterior sternum with 11 bifid setae. Abdominal terga I-VII with two setae, terga VIII-IX with four setae, segment XII with no evidence of posterodorsal process. Vestigial stigmata very much darker than sterna. Flagellum triangular, with a median pit flanked by slight lateral elevations. Pedipalpal trochanter produced distally; other segments elongate; tibia with spur apposible to tarsus-basitarsus; the latter emarginate with spurs about 1/8, claw about 1/3 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 35-6-6-7-8-7-19. Other leg segment measurements given in Table 5.

Female. Flagellum composed of three articles. Spermathecae composed of three or four lobes, the medians possibly trifurcate, the terminations not sclerotized, the laterals the largest.

Type data.—Holotype male taken in La Cueva del Pachón, 15 km SSW Ciudad Mante, Tamaulipas, México, 25 November 1967 (S. Fowler and J. Reddell) (AMNH, examined); allotype female and male and female paratypes taken in La Cueva del Pachón, 6 June 1967 (R. Mitchell) (AMNH, examined).

Comparisons.—*S. cookei* is most closely related to *S. mitchelli*. These two species are distinct from other species in the possession of three pairs of dorsal carapacial setae, wide flagella, a single median depression, and strongly dimorphic pedipalps. The distinctive multi-lobed spermathecae serve to distinguish the females of these two species from those of all other species. *S. mitchelli* has no elevations basolateral to the median flagellar pit in the males whereas *S. cookei* has them. The female median spermathecal lobes are narrower than the laterals in *S. mitchelli*, but just the opposite is the case in *S. cookei*.

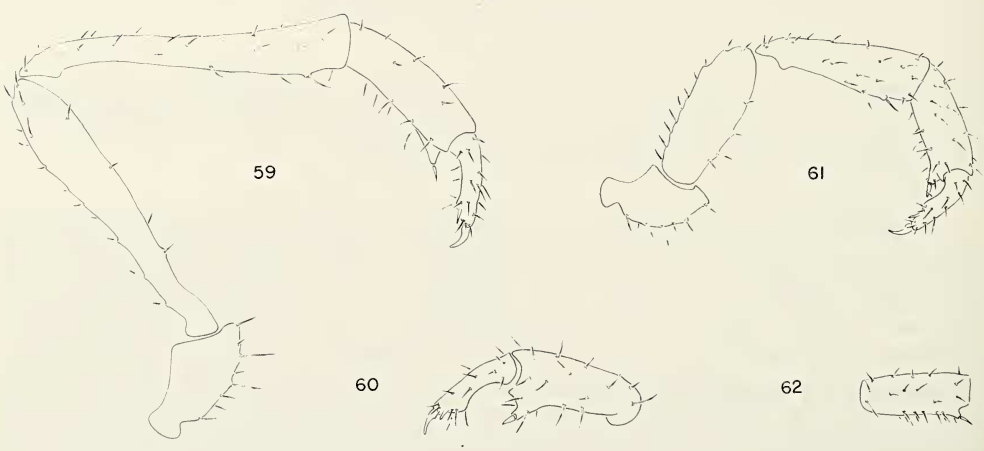
Distribution.—Known only from Cueva del Pachón, Cueva de la Florida, and Grutas de Quintero, Tamaulipas, México.

Remarks.—This species is apparently a troglobite, as is indicated by the lack of eyespots and reduced pigmentation.

Additional records.—See Rowland and Reddell (1977) for other records.

PECKI GROUP

Description .—Members of this group are characterized by large size (1.33-1.76 mm carapacial length). The color is brownish. Eyespots vary from absent to indistinct to distinct. Suspected troglobites lack eyespots. The carapace has two or three pairs of dorsal and two apical setae; the median pair of the dorsal setae of those species with three pairs is invariably the smallest. Males: abdomen never attenuated; posterodorsal process absent; flagella large and bulbous. Females: spermathecae characterized by the median pair usually being much longer than the lateral pair; laterals are absent in some species, but in others are nearly as long as the medians; without much terminal enlargement or



Figs. 59-62.—Male pedipalps of *S. mitchelli*: 59, right, lateral view; 60, right, mesal view of tibia and tarsus-basitarsus only; 61, right, lateral view; 62, left, dorsal view.

localized sclerotization. The pedipalps are very stout in both sexes and do not exhibit dimorphism. The pedipalpal claws are large, usually 2/3 and up to 3/4 the length of the tarsus-basitarsus.

Distribution.–México: Veracruz, Oaxaca, Tabasco, Chiapas. Belize. Guatemala.

Remarks.–See Table 6 for comparisons of the species in the *pecki* group.

Subordinate taxa.–OTU No. 8; *firstmani* complex: *S. firstmani*, OTU No. 2, *S.* sp. cf. *sbordonii; pecki* complex: *S. pecki, S. guatemalensis*, OTU No. 6, OTU No. 7.

Schizomus sp., OTU No. 8
Figs. 63, 81

Schizomus sp. 5:Rowland and Reddell 1977:80, 86, 96, 99.

Description.–Female. Color brownish. Carapace with three pairs of dorsal, the medians very small, and two apical setae. Eyespots distinct. Anterior sternum with nine bifid setae. Abdominal terga I-VII with two setae, terga VIII-IX with four setae. Vestigial stigmata darker than sterna. Flagellum composed of four articles, not distally expanded, elongate. Pedipalpal trochanter produced slightly distally; tarsal-basitarsal spurs about 1/4, claw about 2/3 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 41-7-8-9-10-10-18. Other leg segment measurements given in Table 7. Median and lateral spermathecae slightly convergent, medians about twice as long as laterals, both slightly more sclerotized apically than basally, medians terminating in vague bulbs.

Male unknown.

Type data.– Female and immature taken in Grutas de Monteflor, 6 km N Valle Nacional, Oaxaca, México, 28 December 1972 (J. Reddell, D. McKenzie, M. McKenzie, S. Murphy) (TTU).

Comparisons.–This taxon is unique among members of the *pecki* group in that the female flagellum is not at all expanded distally. In those species possessing three pairs of dorsal carapacial setae, OTU No. 8 is the only one in which the spermathecal tips are sclerotized.

Distribution.–Known only from Grutas de Monteflor, Oaxaca, México.

Remarks.–This species inhabits Grutas de Monteflor with *S. moisii*, a facultative troglophile. The distinct eyespots and moderate pigmentation of OTU No. 8 are also indicative that it is a facultative troglophile.

Schizomus firstmani Rowland
Figs. 63, 65, 67-68, 74-75

Schizomus sp.: Reddell 1971a:219 [Grutas de Atoyac record only].
Schizomus firstmani Rowland 1973a:7, 15, 16-19; Rowland 1973c:136; Dumitresco 1977:157; Rowland and Reddell 1977:80, 84, 98.

Description.–Male. Color brownish. Carapace with three pairs of dorsal, medians very small, and two apical setae. Eyespots absent. Anterior sternum with eight bifid setae. Abdominal terga I-VII with two setae, terga VIII-IX with four setae, segment XII with no

Table 6.—Comparisons of members of the *pecki* group. See the introduction to Rowland and Reddell (1979a) for discussion of characters.

CHARACTER	first-mani	OTU #2	sbor-donii	pecki	guatem-alensis	OTU #6	OTU #7	OTU #8
DORSAL SETAE	3	3	3	2	2	2	2	3
STERNAL SETAE	8	9	9	8	10	13	9	9
EYESPOTS	absent	indis-tinct	distinct	indis-tinct	indis-tinct	absent	indis-tinct	distinct
SPERMA-THECAE	laterals absent	M 2X L	M 3X L	M 2X L	M 4X L	M ±= L	M ±= L	M 2X L
CARAPACAL LENGTH	1.40	1.54	1.52	1.58	1.33	1.41	1.76	1.49
DISTAL EXP. FEM. FLAG.	strong	strong	slight	slight	?	slight	none	none
LENGTH FEM. FLAGELLUM	.38	.47	.39	.46	?	.41	.47	.45
PIT MALE FLAGELLUM	absent	?	?	single	?	?	?	?

evidence of posterodorsal process. Vestigial stigmata darker than sterna. Flagellum compressed laterally, expanded distally, with complex sculpturing. Pedipalpal trochanter produced slightly distally; tarsal-basitarsal spurs about 1/3, claw about 2/3 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 53-8-10-10-10-13-24. Other leg segment measurements given in Table 7.

Female. Flagellum composed of three articles, expanded greatly distally. Median spermathecae only present, long slender, slightly divergent apically, terminating in slight bulbs.

Type data.—Holotype male and immature paratype taken in Grutas de Atoyac, 2 km E Atoyac, Veracruz, México, 24 December 1971 (D. McKenzie) (AMNH, examined); allotype female taken in Grutas de Atoyac, 6 August 1969 (S. and J. Peck) (AMNH, examined); female and three immature paratypes taken in Grutas de Atoyac, 22 August 1965 (J. Reddell, J. Fish, W. Bell) (AMNH, examined).

Comparisons.—This species appears to be most closely related to OTU No. 2. Both species have the female flagellum greatly enlarged distally. This character serves to distinguish them from other American species. *S. firstmani* lacks the lateral spermathecae, whereas OTU No. 2 has them. OTU No. 2 also has a much longer flagellum (0.47 mm) than *S. firstmani* (0.38 mm).

Distribution.–This species is known with certainty only from the type locality; females from three caves in northern Oaxaca are tentatively identified as *S. firstmani.*

Remarks.–This species appears to be a troglobite. It inhabits Grutas de Atoyac with a troglophile species (*Schizomus* sp. cf. *sbordonii*). Females from the three Oaxacan caves (about 30 km distant) are indistinguishable from females of *S. firstmani* and are placed here pending discovery of males. It is, however, doubtful if genetic interchange is possible between these two areas and it is probable that they are recently isolated species of a once wider ranging epigean population.

Additional records.–*Oaxaca*: Cueva Desapareciendo, 2 km W Acatlán, 5 January 1976 (A. Grubbs), 1 female (TTU); Cueva de la Finca, 10 km SW Acatlán, 31 December 1976 (J. Reddell, A. Grubbs, D. McKenzie), 1 female (TTU); Cueva del Nacimiento del Río San Antonio, 10 km S Acatlán, 26 December 1972 (J. Reddell, D. McKenzie, M. McKenzie, S. Murphy), 1 female, 3 immatures (TTU); Veracruz: Grutas de Atoyac, 6 January 1977 (J. Reddell), 2 females, 1 immature (TTU).

Schizomus sp., OTU No. 2
Figs. 63, 70-71, 77, 82

Schizomus sp. 3: Rowland and Reddell 1977:80, 86, 99.

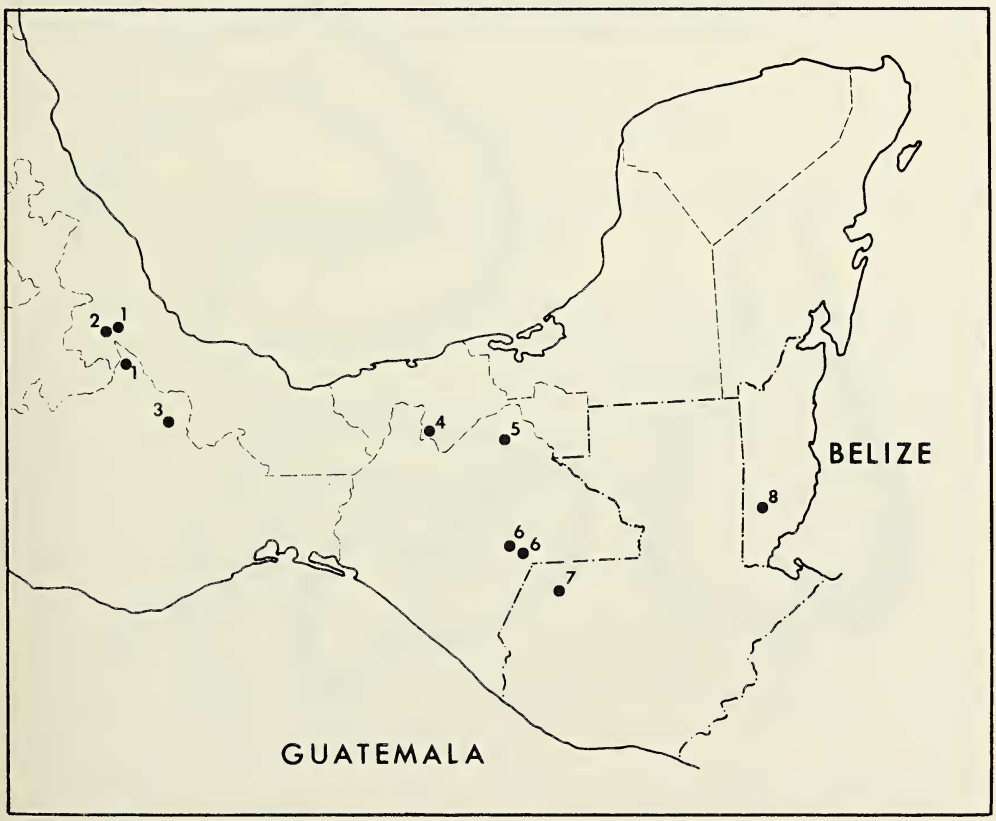
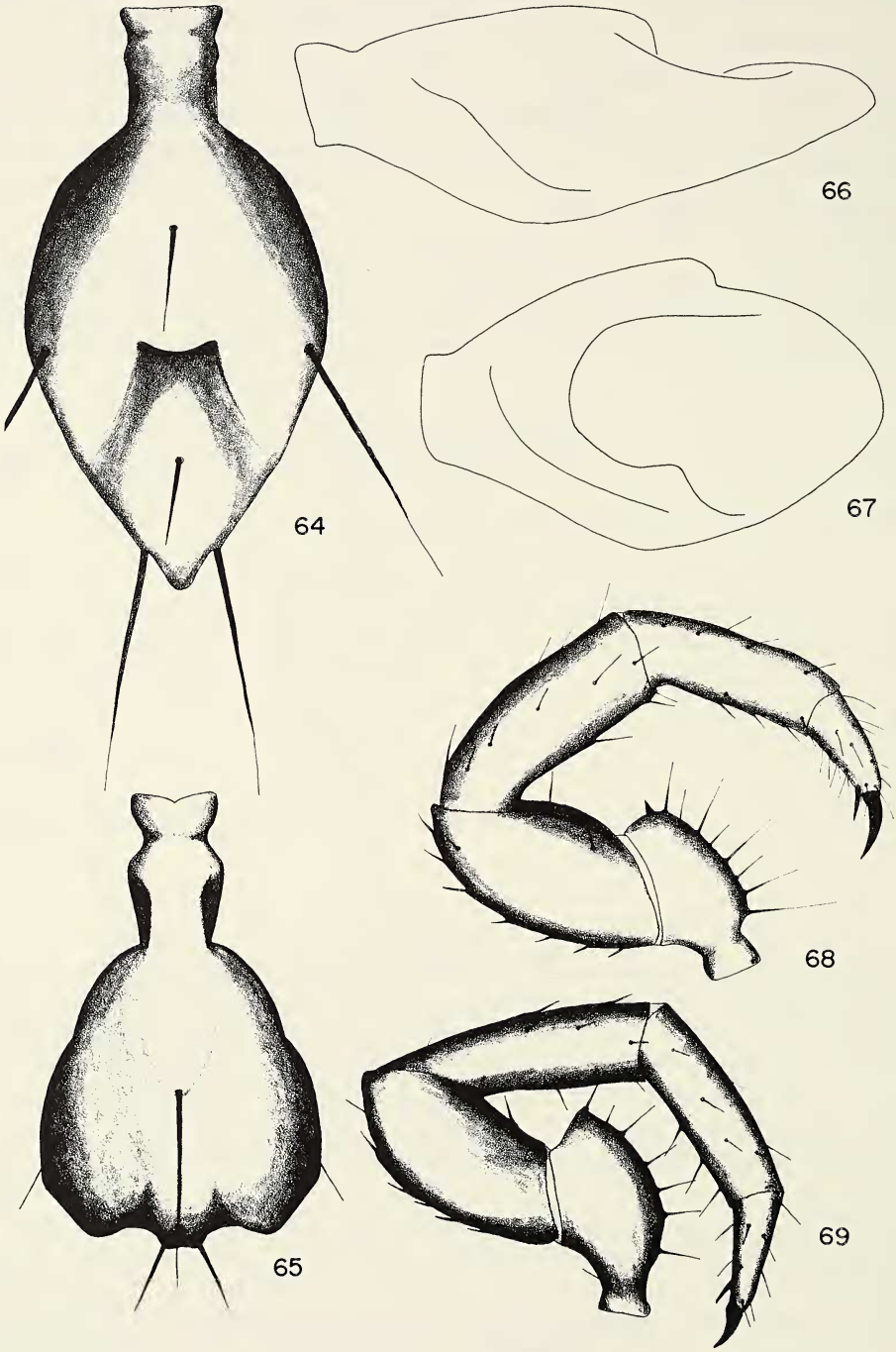


Fig. 63.–Map showing distribution of schizomids of the *pecki* group: 1, *S. firstmani*; 2, *S.* sp. cf. *sbordonii*; 3, OTU No. 8; 4, *S. pecki*; 5, OTU No. 7; 6, OTU No. 2; 7, *S. guatemalensis*; 8, OTU No. 6.



Figs. 64-69.—Parts of schizomids of the *pecki* group: 64-67, male flagella: 64, 65, dorsal views: 64, *S. pecki*; 65, *S. firstmani*; 66, 67, lateral views: 66, *S. pecki*; 67, *S. firstmani*; 68, 69, lateral views of right pedipalps: 68, *S. firstmani*; 69, *S. pecki*.

Description.–Female. Color brownish. Carapace with three pairs of dorsal and two apical setae. Eyespots indistinct. Anterior sternum with nine bifid setae. Abdominal terga I-VII with two setae, terga VIII-IX with four setae. Vestigial stigmata darker than sterna. Flagellum composed of three articles, markedly expanded distally. Pedipalpal trochanter greatly produced distally; tarsal-basitarsal spurs about 1/4, claw about 2/3 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 51-8-10-8-11-10-21. Other leg segment measurements given in Table 7. Median spermathecae twice length of laterals, both divergent, medians curved, with slight bulbs, but no special sclerotization.

Male unknown.

Specimens examined.–Female taken in Grutas de Zapaluta, 4 mi. SE Zapaluta, Chiapas, México, 19 July 1950 (C. and M. Goodnight) (AMNH); female taken in Grutas de Zapaluta, 20 August 1967 (J. Reddell, J. Fish, T. Evans) (TTU); three females and six immatures taken in Grutas de Zapaluta, 28 August 1972 (R. Mitchell, J. Cooke) (TTU); one female and one immature, taken in Sumidero del Camino, 10 mi. NE Comitán, Chiapas, 22 August 1967 (J. Reddell, J. Fish (TTU); one immature taken in Cueva Chica de Hun Chabín, near Comitán, Chiapas, 21 August 1967 (J. Reddell) (TTU).

Comparisons.–See under *S. firstmani.*

Distribution.–Known only from three caves near Comitán, Chiapas, México.

Remarks.–This species is known only from caves, but does not show the advanced troglobitic facies of *S. firstmani*. It is probably a facultative troglophile.

Schizomus sp., cf. *sbordonii* Brignoli

Figs. 63, 73

Schizomus sbordonii Brignoli 1973:7, 8, 9; Rowland 1973c:135, 136; Brignoli 1974:146, 147, 149; Rowland and Reddell 1977:80, 86, 98.

Description (female from Cueva de Atoyac)–Color brownish. Carapace with three pairs of dorsal and two apical setae. Eyespots distinctly round. Anterior sternum with nine bifid setae. Abdominal terga I-V, VII with two setae, terga VI with three setae, terga VIII-IX with four setae. Vestigial stigmata darker than sterna. Flagellum long, composed of three articles, slightly expanded distally. Pedipalpal trochanter produced distally, tarsal-basitarsal spurs about 1/4, claw about 1/2 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 48-8-9-10-11-23. Other leg segment measurements given in Table 7. Median spermathecae three times longer than laterals, both divergent, medians with apical half sclerotized, medians and laterals without terminal bulbs.

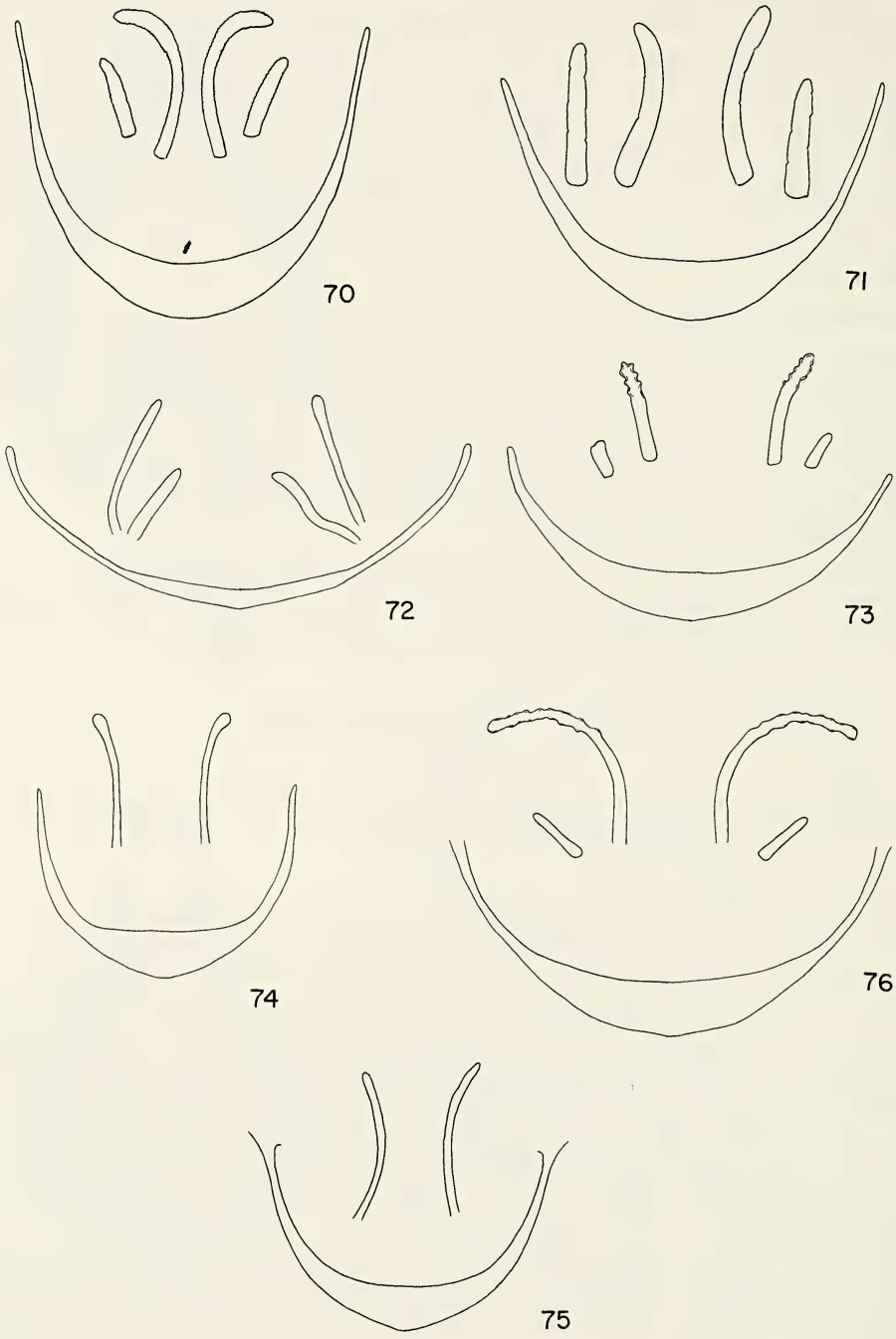
Male unknown.

Type data.–Female holotype taken in Cueva de Ojo de Agua Grande, near Córdoba, Veracruz, México, 5 November 1969 (V. Sbordoni) (IZR, not examined).

Specimen examined.–Female taken in Cueva de Atoyac, 2 km E Atoyac, Veracruz, México, 6 August 1969 (S. and J. Peck) (TTU).

Comparisons.–The specimen studied is very similar to *S. firstmani* and OTU No. 2 in most respects, but differs from them in having very distinct and round eyespots, only a slight expansion of the flagellum, darker pigmentation, and three setae on terga VI.

Distribution.–*S. sbordonii* is known with certainty only from the type locality; the specimen examined is from a cave in the same mountain range.



Figs. 70-76.–Female spermathecae of the *pecki* group: 70, 71, OTU No. 2: 70, from Grutas de Zapaluta, Chiapas; 71, from Sumidero del Camino, Chiapas; 72, OTU No. 7; 73, *S.* sp. cf. *sbordonii*; 74, 75, *S. firstmani*: 74, from the type locality; 75, from Cueva del Nacimiento del Río San Antonio, Oaxaca; 76, *S. guatemalensis.*

Table 7.–Measurements (mm) of species of the *pecki* group: 1, one male, *S. firstmani*; 2, one female, *S. firstmani*; 3, three females, OTU No. 2; 4, one female, *S.* sp. cf. *sbordonii*; 5, one male, *S. pecki*; 6, two females, *S. pecki*; 7, one female, *S. guatemalensis*; 8, one female, OTU No. 6; 9, one female, OTU No. 7; 10, one female, OTU No. 8. Unless other noted all measurements are of lengths.

	1	2	3	4	5	6	7	8	9	10
Carapace	1.25	1.40	1.46–1.54	1.52	1.31	1.55–1.58	1.33	1.41	1.76	1.49
Flagellum										
Length	0.46	0.38	0.46–0.47	0.37	0.60	0.46–0.47	–	0.41	0.47	0.45
Width	0.29	–	–	–	0.29	–	–	–	–	–
Leg I										
Femur	1.85	1.78	1.81–1.87	1.67	2.24	2.05–2.44	1.32	1.53	2.04	1.57
Patella	2.12	2.13	2.08–2.18	2.20	3.74	2.50–2.51	1.56	1.90	2.50	1.90
Tibia	1.48	1.45	1.46–1.50	1.69	2.12	1.88–1.94	1.12	1.44	1.85	1.41
Tarsus-Basitarsus	1.20	1.20	1.20–1.24	1.19	1.25	1.15–1.16	0.99	1.13	1.20	1.03
Leg II										
Femur	1.15	1.18	1.28–1.35	1.22	1.21	1.20–1.36	0.98	1.06	1.45	1.09
Patella	0.56	0.62	0.65–0.73	0.68	0.57	0.61–0.70	0.51	0.54	0.77	0.62
Tibia	0.80	0.80	0.86–0.94	0.84	0.90	0.85–0.85	0.61	0.71	1.00	0.72
Basitarsus	0.59	0.63	0.72–0.76	0.67	0.79	0.73–0.77	0.54	0.55	0.75	0.57
Leg III										
Femur	1.00	1.07	1.20–1.23	1.07	1.10	1.17–1.20	0.87	0.93	1.22	0.95
Patella	0.40	0.52	0.56–0.64	0.55	0.50	0.55–0.59	0.43	0.44	0.58	0.45
Tibia	0.69	0.67	0.80–0.84	0.72	0.75	0.71–0.74	0.50	0.55	0.75	0.54
Basitarsus	0.63	0.73	0.78–0.86	0.73	0.80	0.83–0.84	0.61	0.63	0.82	0.62
Leg IV										
Femur	1.63	1.65	1.78–1.86	1.04	1.96	1.82–1.93	1.34	1.48	1.90	1.49
Patella	0.62	0.68	0.76–0.79	0.75	0.65	0.63–0.83	0.62	0.62	0.80	0.67
Tibia	1.18	1.12	1.28–1.31	1.20	1.36	1.30–1.37	0.92	1.02	1.38	1.08
Basitarsus	1.02	1.04	1.15–1.19	1.01	1.14	1.04–1.11	0.85	0.89	1.16	0.91

Remarks.–The specimen described from Cueva de Atoyac is considered likely to be identical to *S. sbordonii* on geographical grounds. The description and illustrations given by Brignoli (1973, 1974), while inadequate to recognize any species, do not contraindicate the specimen studied. The types of *S. firstmani* were collected with the specimen tentatively assigned to *S. sbordonii*. Recent collections of the inner chambers of Cueva de Atoyac have included only *S. firstmani; S.* sp. cf. *sbordonii* may have been found near the entrance. *S. sbordonii* is probably a facultative troglophile.

Schizomus pecki Rowland
Figs. 63-64, 66, 69, 79

Schizomus pecki Rowland 1973a:7, 16, 19-23; Rowland 1973c:136; Sbordoni, Agrano, and Zullini 1974:14-15; Dumitresco 1977:157; Rowland and Reddell 1977:80, 83, 84, 98-99.

Description.–Male. Color brownish. Carapace with two pairs of dorsal and two apical setae. Eyespots indistinct. Anterior sternum with eight entire setae. Abdominal terga I-VII with two setae, terga VIII-IX with four setae, segment XII without evidence of posterodorsal process. Vestigial stigmata darker than sterna. Flagellum lanceolate, with a

median depression following a single median gentle elevation. Pedipalpal trochanter produced distally; tarsal-basitarsal spurs about 1/5, claw about 2/3 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 62-8-10-9-9-19. Other leg segment measurements given in Table 7.

Female. Flagellum composed of three articles, slightly expanded distally. Median spermathecae twice length of laterals, both divergent, medians curved, but without terminal bulbs, both pair with light sclerotization along distal half of both lobes.

Type data.—Holotype male taken in Las Grutas del Coconá, 2 mi. NE Teapa, Tabasco, México, 1 August 1948 (C. Goodnight) (AMNH, examined); allotype female and paratype female taken in Las Grutas del Coconá, 29 November 1971 (D. McKenzie) (AMNH, examined).

Comparisons.—The presence of two pairs of dorsal carapacial setae serves to distinguish *S. pecki* from *S. firstmani, S.* sp. cf. *sbordonii*, and OTU No. 2. This species is also distinct in possessing a long (0.40 mm), slightly expanded flagellum. The pedipalpal claw of *S. pecki* is distinctly smaller than that of OTU No. 7 and distinctly larger than that of OTU No. 6 and *S. guatemalensis.* The medians of the spermathecae of *S. pecki* are shorter than are those of *S. guatemalensis*, but are longer than are those of OTU No. 6 and OTU No. 7.

Distribution.—Known only from two caves 3 km NE Teapa, Tabasco, México.

Remarks.—*S. pecki* is apparently a troglobite. It has been found in abundance on silt under rotten wood in the more remote sections of Grutas del Coconá. The troglophilic *S. trilobatus* Rowland inhabits leaf litter near the entrance of the cave.

Additional records.—*Tabasco*: Grutas del Coconá, 24 July 1973 (J. Reddell, J. M. Rowland), 3 females, 3 immatures (TTU); Resumidero del Coconá, 3 km NE Teapa, 14 June 1975 (J. Reddell, A. Grubbs), 1 immature (TTU).

Schizomus guatemalensis Chamberlin
Figs. 63, 76

Schizomus guatemalensis Chamberlin 1922:12; Mello-Leitão 1931:17; Giltay 1935:6; Gertsch 1941:14; Takashima 1943:93; Rowland and Reddell 1977:99.

Description.—Female. Color brownish. Carapace with two pairs of dorsal and two apical setae. Eyespots indistinct. Anterior sternum with 10 bifid setae. Abdominal terga I-VII with two setae, terga VIII-IX with four setae. Vestigial stigmata darker than sterna. Flagellum missing. Pedipalpal trochanter produced distally; tarsal-basitarsal spurs about 1/5, claw about 1/2 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 40-6-8-7-9-9-20. Other leg segment measurements given in Table 7. Median spermathecae long and slender, strongly curved outwardly, lightly sclerotized along distal 2/3, terminating in a slight bulb; laterals about 1/4 as long, straight, but directed diagonally outward, no terminal bulb or special sclerotization.

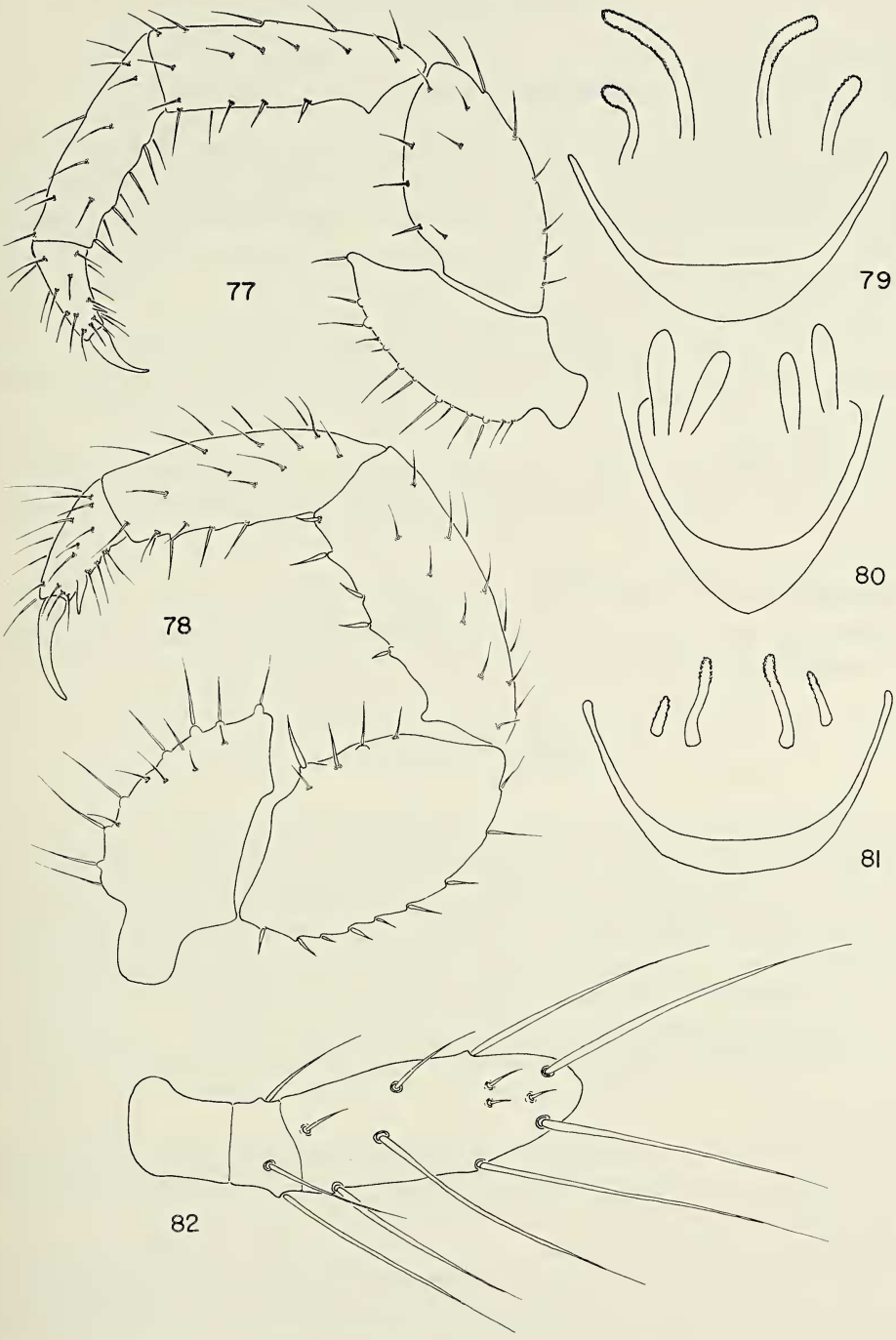
Male unknown.

Type data.—Holotype female taken at San Rafael, Guatemala (MCZ, examined).

Comparisons.—See under *S. pecki.*

Distribution.—Known only from the type locality.

Remarks.—The type locality cannot be identified with certainty to any of the several communites of the name San Rafael in Guatemala.



Figs. 77-82.–Parts of schizomids of the *pecki* group: 77, 78, lateral views of female left pedipalps: 77, OTU No. 2; 78, OTU No. 7; 79-81, spermathecae: 79, *S. pecki*; 80, OTU No. 6; 81, OTU No. 8; 82, lateral view of flagellum of OTU No. 2.

Schizomus sp., OTU No. 6
Figs. 63, 80

Schizomus sp. 4: Rowland and Reddell 1977:80.

Description.—Female. Color brownish. Carapace with two pairs of dorsal and two apical setae. Eyespots absent. Anterior sternum with 13 bifid setae. Abdominal terga I-VII with two setae, terga VIII-IX with four setae. Vestigial stigmata darker than sterna. Flagellum composed of three articles, long, slightly distally expanded. Pedipalpal trochanter produced distally; tarsal-basitarsal spurs about 1/4, claw about 1/2 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 45-8-9-10-11-20. Other leg segment measurements given in Table 7. Median and lateral spermathecae about same size, slightly convergent, gradually expanded distally; no special sclerotization or apical bulbs.

Male unknown.

Specimen examined.—Female taken in St. Herman's Cave (400 ft.), Caves Branch, British Honduras [=Belize], between 23 July and 21 August 1972 (S. and J. Peck) (AMNH).

Comparisons.—See under *S. pecki.*

Distribution.—Known only from St. Herman's Cave, Belize.

Remarks.—The very light pigmentation and lack of eyespots in this species suggests that it is an obligate cavernicole.

Schizomus sp., OTU No. 7
Figs. 63, 72, 78

Description.—Female. Color brownish. Carapace with two pairs of dorsal and two apical setae. Eyespots indistinct. Anterior sternum with nine bifid setae. Abdominal terga I-VII with two setae, terga VIII-IX with four setae. Vestigial stigmata darker than sterna. Flagellum broken, but appearing not to be greatly expanded distally. Pedipalpal trochanter produced distally; tarsal-basitarsal spurs about 1/3, claw about 3/4 length of tarsus-basitarsus. Tarsal-basitarsal segments of leg I of the following approximate proportions: 50-7-10-9-9-11-24. Other leg segment measurements given in Table 7. Median spermathecae slightly smaller than laterals, both convergent, not sclerotized, not terminating in bulbs.

Male unknown.

Specimens examined.—Female taken at Las Ruinas de Palenque, Chiapas, México, July 1948 (C. and M. Goodnight) (AMNH); two immatures taken at Las Ruinas de Palenque, 25 July 1973 (J. Reddell) (TTU).

Comparisons.—This species seems to be most closely related to *S. pecki* in that they share a similarity in development of the spermathecae, and two pairs of dorsal carapacial setae. The pedipalpal claw is relatively shorter in *S. pecki* than in OTU No. 7; the carapace of *S. pecki* is also shorter (1.55-1.58 mm) than is that of OTU No. 7 (1.76 mm). See also under *S. pecki.*

Distribution.—Known only from Las Ruinas de Palenque, Chiapas, México.

Remarks.—This species was found under rocks on the deeply shaded canyon walls above the ruins.

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